

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Amendment of Parts 2 and 90 of the)	RM-11715
Commission's Rules To Create a New)	
Frequency Allocation for Wireless)	
Broadband Services)	

To: The Commission

Comments of Shared Spectrum Company

April 10, 2014

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COMMENTS OF SHARED SPECTRUM COMPANY

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Shared Spectrum Company hereby submits its Comments in the above referenced proceeding in response to the FCC’s Public Notice released on March 1, 2014 concerning a Petition for Rule Making filed by Mimosa Networks, Inc. (“Mimosa”).¹ In its Petition, Mimosa seeks reallocation of the 10.0-10.5 GHz band (herein, the “10 GHz band”) for wireless broadband services.

SUMMARY

Shared Spectrum Company (“SSC”) is a leader in developing spectrum sharing technologies including Dynamic Spectrum Access (“DSA”) radios, frequency sensors, and software applications. SSC has consistently participated in FCC proceedings that involve the potential to open new spectrum bands for sharing among different types of users, such as Federal entities and non-Federal users, and sharing among different types of devices, such as radars and two way radios. For example, in the “Incentive Auction” proceeding, SSC filed Comments and Reply Comments in which SSC noted that sharing can be accomplished in a manner that

¹ See Public Notice, Consumer and Governmental Affairs Bureau Reference Information Center Petition for Rulemaking Filed, Report No. 3002 (CGB rel. Mar. 11, 2014) (citing 47 C.F.R. §§ 1.4 & 1.405).

will promote innovation in the Broadcast bands and ensure that Broadcast licensees do not experience harmful interference.² SSC pointed out that sensing technologies, in particular, can play a large role in maximizing the efficient use of those bands.

Similarly, in the 3.5 GHz proceeding, SSC pointed out that sensing technologies can help reduce exclusion zones between military radars and other, commercial devices.³ In addition, SSC participated in the recent 5 GHz proceeding, urging the Commission to authorize frequency sensing technologies in certain portions of the 5 GHz in order to expand unlicensed use of the spectrum.⁴

Involvement in spectrum sharing policy making is nothing new for SSC. In fact, our original comments led to the creation of the TV White Spaces proceeding. SSC has been deeply involved in preparation of the PCAST Report, as well as the work of CSMAC, related to spectrum sharing.⁵

² *In the Matter of Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Notice of Proposed Rule Making, Docket No. 12-268, released October 2, 2012.

³ *In the Matter of Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Notice of Proposed Rule Making and Order, GN Docket No. 12-354, released December 12, 2012.

⁴ See, Comments of Shared Spectrum Company, May 28, 2013, Revision of Part 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band, ET Docket No. 13-49.

⁵ The President's Council of Advisors on Science and Technology (PCAST) prepared a report that examined how advances in situation-aware spectrum-sharing technologies could facilitate commercial use while preserving the mission capabilities of federal users. President's Council of Advisors on Science and Technology (PCAST), *Realizing the Full Potential of Government-Held Spectrum to Spur Economic Growth at 30* (July 20, 2012) (*PCAST Report*), available at http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast_spectrum_report_final_july_20_2012.pdf

The Commerce Spectrum Management Advisory Committee (CSMAC) made recommendations on using dynamic spectrum access and geo-location/database approaches to offer new opportunities to increase spectrum sharing. NTIA, Commerce Spectrum Management Advisory Committee, *Final Report of the Interference and Dynamic Spectrum Access Subcommittee* (Nov. 8, 2010) (*CSMAC Subcommittee Final Report*), available at http://www.ntia.doc.gov/files/ntia/publications/interference-dynamic_spectrum_access_subcommittee.pdf.

SSC strongly believes that in order to meet the growing demand for commercial spectrum, and unlicensed spectrum, sensing based technologies need to be placed at the forefront of US regulatory policy. SSC believes that spectrum can be shared using what it calls “DSA” technology, also referred to by Mimosa as “DFS”, or “Dynamic Frequency Selection,” technology. SSC agrees with Mimosa that this sensing technology should be deployed in the 10 GHz band, using sensing alone, rather than sensing in tandem with a database. The time is right for bold action to increase the availability of spectrum for wireless broadband use, including backhaul and similar applications, on a point-to-point and point-to-multipoint basis.

COMMENTS

A. Spectrum Policies Should Match the Growth of Wireless Broadband Services

SSC agrees with Mimosa that the Commission needs to continue to aggressively promote reallocation of spectrum for wireless broadband services. These reallocation efforts are achieved through changes in frequency allocations and related rules for use of the spectrum, including permission for entrants to deploy sensing-based technology.

In its PCAST Report, the Administration called for the reallocation of 1,000 MHz of spectrum from Federal government to shared use.⁶ Since the release of the PCAST Report, only a small fraction of this 1,000 MHz target amount has been

⁶ See, PCAST Report, at vii; See also “Unleashing the Wireless Broadband Revolution,” 2010 Presidential Memorandum (requiring 500 MHz of spectrum to be made available for commercial use within 10 years).

proposed for reallocation, and much of *that* spectrum suffers from restrictions on its use. In the 3.5 GHz band, for example, large exclusion zones are proposed to protect military radars.

Against this background, Mimosa's proposal to share 500 MHz in the 10 GHz band for wireless broadband use would help to fulfill the unrealized promise of the PCAST Report to open a large amount of spectrum for commercial use. Mimosa correctly points out that in the brief period of 20 months since the release of the PCAST Report, demand for broadband services has continued to outpace forecasts; therefore, in SSC's view, even the proposed sharing of 500 MHz in the 10 GHz band may be too modest of a goal to meet the burgeoning demand for wireless broadband services.

Much is at stake in the quest to share spectrum between incumbent users and new wireless broadband services. For American consumers and businesses, the health of our economy and well-being of our citizens will increasingly depend upon access to broadband connectivity. For example, access to wireless broadband services helps provide rural residents with remote healthcare and brings educational opportunities to underserved and underprivileged Americans.

SSC supports the allocation of 500 MHz in the 10 GHz band. The Commission should act swiftly in this regard, since it takes manufacturers and consumers several years after the allocation of a spectrum band in order to fully capture its benefits.

For example, the 5 GHz band was first allocated for unlicensed applications, such as what we today know as “Wi-Fi”, back in 1997, but it was not until the mid-2000s that equipment makers and consumers began to gain critical mass in this spectrum band.

Similarly, the TVWS proceeding is now a few years old, but we have yet to see critical mass achieved in those bands in terms of manufacturer and consumer use. Instead, makers and consumers remain cautious in their deployment of TVWS equipment tied to databases.

In SSC’s opinion, the Commission should quickly enact rules to permit sharing the 10 GHz band with wireless broadband services. Mimoso correctly points out the benefits of the 10 GHz band versus other possible bands. For example, the 10 GHz band offers better propagation characteristics than the much higher bands available today, such as the 70/80 GHz bands, and the 10 GHz band suffers less rain fade than those higher bands. The complementary nature of proposed 10 GHz large cells with the proposed 3.5 GHz small cells is evident. SSC supports Mimoso’s view that the 10 GHz band is well-suited for backhaul and that WISPs and other users would benefit from this allocation.

Mimoso also points out that across all three International Telecommunication Union (“ITU”) Regions, the 10 GHz band is allocated for Radiolocation and Amateur Radio users. However, ITU Regions 1 and 3 also

allocate the 10 GHz band for Fixed and Mobile operation. Therefore, including the 10 GHz band under the proposed Part 90, Subpart Z, rules would bring ITU Region 2 into alignment with Regions 1 and 3.

B. Sensing Technology Should be Used Exclusively in the 10 GHz Band

The Commission should also permit sensing in this 10 GHz band on a stand-alone basis, i.e. without a database. On page 18 of its Petition for Rule Making, Mimosa states that sharing the 10 GHz band will be readily achievable under its proposal, in part because the band is lightly used, and in part because its proposal would require all entrants to use a contention-based protocol.⁷

SSC agrees that use of a contention-based protocol such as SSC's own DSA technology would help achieve a high degree of efficiency and re-use of the 10 GHz band. SSC also agrees with Mimosa's statement on page 18 that: "In addition, application of the contention-based protocol will also accelerate widespread use of the band for wireless broadband services through the use of low-cost radio implementations based upon Wi-Fi chipsets."

In addition to a contention based protocol, Mimosa on page 20 of its Petition further proposes that all entrants use Dynamic Frequency Selection, or DFS technology, to prevent interference to existing radars and other incumbents.⁸

⁷ Mimosa also proposes to protect Amateur Radio users by adopting a Guard Band.

⁸ Citing Cisco Systems, Inc., "Dynamic Frequency Selection," 2008, available at <http://www.cisco.com/en/US/docs/routers/access/3200/software/wireless/RadioChannelDFS.pdf> (explaining that "DFS is the

Mimosa points out that DFS technology should be used as a stand-alone solution, not in concert with the unproven concept of a Spectrum Access System or database, as proposed by the Commission in other bands.

SSC agrees with Mimosa's proposal that the FCC should not encumber sensing technologies by requiring them to link to a database. Instead, the same type of proven, "listen-before-talking" technology that is in use today in Wi-Fi equipment and other gear can be readily deployed in the 10 GHz band. In the largely empty 10 GHz band, requiring a database or similar SAS to stand in the way between users with contention-based protocol technology radios and their use of the unlicensed 10 GHz frequencies would be both unnecessary and overly complex. In addition, the Commission recently declined to require a database approach in the 5 GHz band, noting that its recent rule changes, such as sensing thresholds and sensing bandwidth, should more than adequately protect incumbent radars in that band.⁹

The DSA radio technology offers both a contention-based protocol and a DFS solution, all in one. By listening before transmitting, the sensing "brains" of the radio can pick the correct channel and avoid the channel being used by the incumbent user. Sensing is already done in most of our everyday applications, from Wi-Fi to smartphones, -- familiar consumer devices select open channels and avoid

process of detecting radar signals that must be protected against interference from . . . radios, and upon detection switching the operating frequency of the . . . radio to one that is not interfering with the radar systems").

⁹ *Revision of Part 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band*, ET Docket No. 13-49, First Report and Order, April 1, 2014, at para. 70.

others. By formalizing this technology into the new Part 90, Subpart Z of the FCC rules, the Commission would simply be codifying what exists today, and what SSC is a leader at providing: proven, world-class, spectrum sensing solutions that enable frequencies to be: shared in real time, re-used efficiently, and wisely allocated.

CONCLUSION

The Commission should re-allocate the 10 GHz band to wireless broadband services. The 10 GHz band is ideal for longer-haul applications as compared to higher bands, such as the 70/80 GHz band. The 10 GHz band is already allocated in ITU Regions 1 and 3 for similar use. And the 10 GHz band is lightly used today.

SSC makes sensing technology, which it refers to as “DSA”, and which Mimosa refers to as “DFS” technology. Whatever the chosen acronym, frequency sensing technology is in use throughout our daily lives. Frequency sensing permits people to share the same Wi-Fi bands in crowded coffee shops and at busy airports, for example. SSC believes that the Commission should require new entrants to share the 10 GHz band by adopting technology which is sensing-based, as proposed by Mimosa in its Petition for Rule Making.

SSC urges swift action by the Commission, since a decision this year will likely not result in marketplace benefits for a few more years,-- in light of the considerable time it takes for manufacturers to adjust product portfolios and

services. With booming consumer demand for wireless broadband, the FCC cannot act soon enough, in SSC's view, to expand the available spectrum and authorize sensing on a stand-alone basis, without a database.

Respectfully submitted,

/s/

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