

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

In the Matter of)	
)	
Office of Engineering and Technology and)	ET Docket No. 15-105
Wireless Telecommunications Bureau Seeks)	
Information on Current Trends in LTE-U and)	
LAA Technology)	

**COMMENTS OF
CAMBIUM NETWORKS, LTD.**

Cambium Networks, Ltd. (“Cambium”), by counsel, files these Comments in response to the above-captioned Public Notice regarding current trends in LTE-Unlicensed (“LTE-U”) and Licensed Assisted Access (“LAA”) technology.¹ The Public Notice seeks comment on the development of LTE-U and LAA “in the context of the 3.5 GHz and 5 GHz proceedings, which would make spectrum available for general access and unlicensed use, respectively.”² Cambium urges the Commission to carefully consider the potential impact of such technologies in light of the policies that have resulted in widespread growth and adoption of broadband via unlicensed and shared access models. Commission policies of flexible use and technological neutrality have enabled competition and innovation by reducing the high entry barriers associated with licensed spectrum, and by boosting utilization in these bands of a variety of solutions to meet the skyrocketing public demand for Internet access services. In light of the pro-competition, pro-consumer benefits of the 3.5 GHz and 5 GHz spectrum models, Cambium urges the Commission to carefully develop a record on LTE-U and LAA technologies and to retain technologically-neutral policies toward future uses of this spectrum.

¹ *Office of Engineering and Technology and Wireless Telecommunications Bureau Seek Information on Current Trends in LTE-U and LAA Technology*, Public Notice, ET Docket No. 15-105 (rel. May 5, 2015)(“*Public Notice*”).

² Public Notice at 1.

Cambium is a leading global provider of wireless broadband solutions, with an extensive portfolio of wireless broadband point-to-point (“PTP”) and point-to-multipoint (“PMP”) platforms. More than 4,000,000 Cambium radios have been deployed for access and backhaul in a total of more than 150 countries. Cambium has developed and brought to market 5 GHz and 3.65 GHz equipment options for a variety of broadband operators and users, including Wireless Internet Service Providers and other ISPs, governmental and military agencies, oil, gas and utility companies, and public safety networks.

The Commission’s inquiry into LTE-U/LAA arises at a time when unlicensed and lightly licensed spectrum choices have contributed to a vibrant, fast-growing broadband infrastructure. Commission policies shape this infrastructure by “encourag[ing] the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans...”³ Alternative models to traditional spectrum licensing have boosted broadband deployment. The availability of unlicensed spectrum at 5 GHz has led to tremendous growth in Wi-Fi and other services, and the Commission’s new general access model for the 3.5 GHz band (the forthcoming Citizens Band Radio Service) also has great potential for encouraging the development of innovative services.⁴ Users of unlicensed or general access bands share spectrum and manage interference based on flexible ground rules that support innovative, market-based deployments. While operators of licensed spectrum enjoy greater interference protection than operators of unlicensed or “lightly licensed” spectrum, technical standards and operating norms have evolved to allow effective management of interference in unlicensed spectrum and to promote the growth of broadband

³ 47 U.S.C. §1302(a). “Advanced telecommunications capability” is defined to include “broadband telecommunications capability.” *Id.* § 1302(d)(1). By statute, the FCC is charged with making “available ... to all the people of the United States ... a rapid, efficient, Nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges.” 47 U.S.C. §151.

⁴ See Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band, GN Docket No. 12-354, *Report and Order and Second Further Notice of Proposed Rulemaking* (adopted April 17, 2015).

services in many parts of the country.

Principles of technological neutrality should govern the Commission's inquiry

In light of the demonstrated benefits of unlicensed and lightly licensed spectrum models, the Office of Engineering and Technology (“OET”) and the Wireless Telecommunications Bureau (“WTB”) have acknowledged a policy of technological neutrality in the Public Notice. Cambium agrees. The FCC’s technologically neutral policy for unlicensed spectrum at 5 GHz has helped to make that band into a successful alternative to command-and-control licensing. That said, the Part 15 operating rules support not only low-power 802.11 Wi-Fi devices but also other vital services such as backhaul. Cambium and others manufacture cost-effective fixed point-to-point wireless solutions that use higher-gain antennas in the 5 GHz band to deliver broadband and backhaul in rural areas. The availability of unlicensed spectrum with flexible service rules has allowed Cambium and others to develop the tools to promote innovative, competitive services in the 5 GHz band. Part 15 rules accommodate many types of systems operating in the 5 GHz band, not just 802.11 and LTE-U, so maintaining technological neutrality will be critical to preserve the successes of the band.

The Public Notice identifies concerns expressed by some that “LTE-U and LAA operations may have a detrimental impact on existing and future use of unlicensed or shared access spectrum.”⁵ For example, some have raised concerns that operators of licensed spectrum could overwhelm available unlicensed spectrum by tying 5 GHz spectrum exclusively to downlink traffic, and utilizing licensed spectrum for uplink traffic and control channel messaging. More broadly, introducing significant amounts of new traffic into the unlicensed bands would add to overall spectrum congestion. The potential for coexistence between LTE-

⁵ Public Notice at 1.

U/LAA and Wi-Fi services is only part of the issue. Services like backhaul must be considered as well, particularly in light of the importance of affordable backhaul in delivering broadband to rural America. Cambium urges the Commission to maintain stringent, technologically-neutral application of the Part 15 rules and to carefully examine and rigorously test for the realistic potential for coexistence between LTE-U/LAA technologies and other authorized services, particularly given the successful deployments that already exist in the marketplace.

The Commission should consider the competitive impact of LTE-U/LAA Services in the CBRS and 5 GHz bands

As the Commission assesses whether and to what extent LTE-U/LAA can co-exist with Wi-Fi, long-range backhaul and other services in these bands, Cambium believes that the “potential detrimental impact” is broader than mere technical feasibility. The unlicensed spectrum model makes spectrum available to a broad range of operators by reducing a key entry barrier – the cost of spectrum access – and thus facilitating competition and innovation. The successes of the 5 GHz band are due, in part, to the high performance-to-price ratio associated with equipment that uses unlicensed spectrum. By lowering the costs of access to spectrum, Commission policies toward unlicensed spectrum spur new competition that facilitates pro-consumer benefits, such as enhancing competition in pricing and services. That said, much work remains to be done on a national scale to advance policies toward enabling cost-effective broadband deployments to rural areas.

Setting aside significant portions of these unlicensed and/or general access bands for the exclusive benefit of one industry segment or of one group of competitors introduces a potential competitive imbalance and unwarranted burdens on operators that already have deployed a variety of broadband services. Such preferential treatment would contravene the technological

neutrality principle and the pro-marketplace approach embodied in the current Part 15 rules. To the contrary, even today, carriers remain free to operate in these bands consistent with the same technical rules that apply to other competitors, such as EIRP limits and spectral density. Accordingly, Cambium urges OET and the Bureau to supplement their information gathering by giving due consideration to the potential competitive impact of these new technologies.

Conclusion

In considering LTE-U/LAA, the Commission must work to ensure that such services would not cause detrimental impact to current uses of 5 GHz and CBRS spectrum. Cambium therefore urges the Bureau and OET to compile and carefully examine a comprehensive record of these new technologies in light of existing Commission policies of technological neutrality and pro-competitive approaches to allocating scarce spectrum resources.

Respectfully submitted,

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