A Path to Greater Connectedness

Coleman Bazelon and Paroma Sanyal

May 2020

On April 19, 2020, the Federal Communications Commission (FCC) unanimously approved Ligado Networks's application to deploy a low-power nationwide terrestrial network in the L-Band, which will support 5G deployment and the internet of things (IOT).[1] This decision shows that the FCC is committed to its 5G Fast Plan – an initiative to make additional spectrum available for 5G services in low, mid, high, and unlicensed bands [2] – and continues to work to fulfill the 2010 Presidential Initiative to make an additional 500 megahertz (MHz) of spectrum available for mobile broadband in this decade.[3] This decision will support the US's continued leadership in the mobile wireless field.

Ericsson estimates that by 2025, mobile subscriptions will reach 8 billion. Of these, 2.6 billion will be 5G subscriptions. Additionally, IOT connections will increase from 10.8 billion to 24.9 billion from 2019 to 2025.[4] The burgeoning data demands from current users and data-intensive new uses, plus the data requirements for the IOT, are pushing the boundaries of spectrum use – both in terms of intensity and the bands of spectrum deployed. As the current COVID-19 crisis makes clear, connectedness has become essential. To fill the need for ubiquitous high-quality coverage and capacity, we must use our scarce spectrum resources as efficiently as possible. This brings the greatest value to the US consumer.

The L-Band spectrum has been a controversial topic for years. Ligado owns the uplink and downlink spectrum bands around the spectrum that GPS uses, the radionavigation satellite spectrum (RNSS). The main concern is the L-Band upper downlink adjacent to the spectrum band used by GPS devices (1559–1610 MHz). GPS stakeholders have held that if the FCC allows Ligado to operate terrestrial operations in their spectrum, it will interfere with GPS operations.

To address these concerns, almost four years ago Ligado reached an agreement with most GPS stakeholders in which it voluntarily agreed to specific out-of-band emissions limits and base station power limits of 32 decibel watts (dBW) in the 1526–1536 MHz band and the 1670–1700 MHz band.[5] As early as 2016, Brattle Principal Coleman Bazelon wrote about the economic value of putting this mid-band spectrum to work for 5G deployments.[6]

Later, in its amended application, Ligado agreed to further reduce the power level to 9.8 dBW – a 99% reduction from its original application. The FCC's recently approved order concludes that these reduced power levels, along with a 23 MHz guard band, are sufficient to protect incumbents, while allowing for low-power terrestrial deployment in the 1526–1536 MHz, 1627.5–1637.5 MHz, and 1646.5–1656.5 MHz bands. According to the current plan, Ligado will not operate in the band adjacent to the GPS band (RNSS band); i.e., it will not operate a terrestrial network in the

1545–1555 MHz band, allowing for a 23 MHz guard band between its lower downlink and GPS spectrum. As shown in Figure 1 below, this largely eliminates the interference issue.

Combined with the reduced power levels, these commitments will drive down the potential cost of allowing low-power terrestrial deployment nearly to zero, as there appear to be limited interference concerns. On the benefits side, although the lowered power makes this spectrum less valuable than earlier estimates, it is still a highly desirable spectrum for IOT and private networks. The zero cost associated with this policy makes any benefit a net positive. By allowing Ligado to deploy its network, with conditions, the FCC has moved towards advancing a more connected economy.

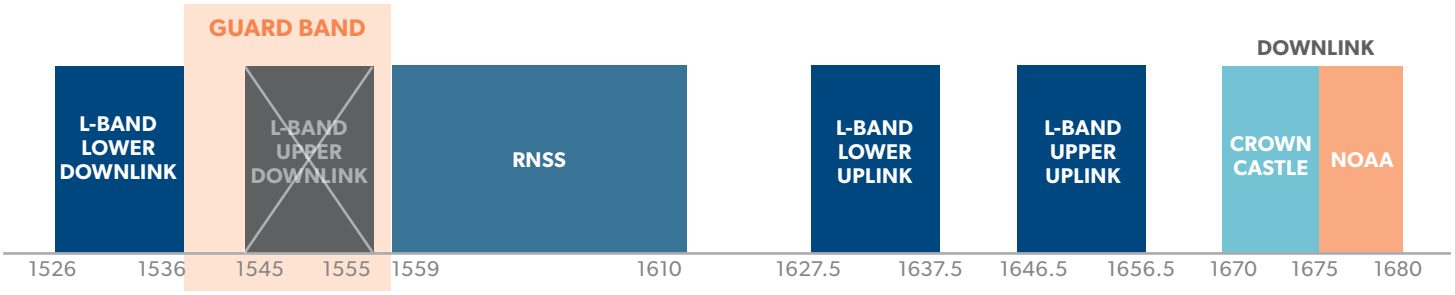

FIGURE 1: LIGADO'S SPECTRUM

ENDNOTES

1 FCC, "Chairman Pai Circulates Draft Order To Approve Ligado's Application To Facilitate 5G And Internet Of Things Services," April 16, 2020, https://www.fcc.gov/document/chairman-pai-circulates-draft-order-approve-ligados-application. See also, FCC, "FCC Unanimously Approves Ligado's Application To Facilitate 5G And Internet Of Things Services," April 20, 2020, https://www.fcc.gov/document/fcc-approves-ligados-application-facilitate-5g-and-iot-services.

2 FCC, "The FCC's 5G Fast Plan," September 28, 2018, https://www.fcc.gov/document/fccs-5g-fast-plan.

3 The White House, Office of the Press Secretary, "Presidential Memorandum: Unleashing the Wireless Broadband Revolution," June 28, 2010, https://obamawhitehouse.archives.gov/the-press-office/presidential-memorandum-unleashing-wireless-broadband-revolution

4 Ericsson, "Ericsson Mobility Report," November 2019, https://www.ericsson.com/en/mobility-report/reports/november-2019.

5 See Letter from Gerard J. Waldron to Marlene H. Dortch, IB Docket No. 12-340, Dec. 8, 2015, http://apps.fcc.gov/ecfs/document/view?id=60001352936; and Letter from Gerard J. Waldron to Marlene H. Dortch, IB Docket No. 12-340, December 17, 2015, http://apps.fcc.gov/ecfs/document/view?id=60001388035.

6 Coleman Bazelon, "Putting Mid-Band Spectrum to Work: Sharing between Ligado and its GPS Neighbors," Prepared for the FCC, May 23, 2016, http://licensing.fcc.gov/myibfs/download.do?attachment_key=1136780.

ABOUT BRATTLE

The Brattle Group answers complex economic, finance, and regulatory questions for corporations, law firms, and governments around the world. We are distinguished by the clarity of our insights and the credibility of our experts, which include leading international academics and industry specialists. Brattle has over 350 talented professionals across three continents. For more information, **please visit brattle.com.**