



April 26<sup>th</sup>, 2021

The Manager  
Spectrum Management Outlook and Strategy Section  
Australian Communications and Media Authority  
PO Box Q500

Queen Victoria Building NSW 1230

Response to Draft Five-Year Spectrum Outlook 2021–26 - Consultation 10/2021

Motorola Solutions is pleased to provide our comments on the ACMA's "Draft Five-year spectrum outlook 2021–21", attached.

Please let me know if you have any questions.

Yours sincerely,

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## **Draft Five-Year Spectrum Outlook 2020–24**

Motorola Solutions Inc (MSI) thanks the ACMA for the opportunity to comment on its public consultation document 10/2021, “*Draft Five-year Spectrum Outlook 2021–26*”.

Motorola Solutions is a global leader in mission-critical communications. Our platforms in communications, command center software, video security and analytics, and managed and support services make cities safer and help communities and businesses thrive. We serve more than 100,000 customers in more than 100 countries, with 18,000 employees and an install base of more than 13,000 systems around the world.

We have been a leader in mission-critical communications for over 90 years.

We are pleased to present our feedback in details:

### **Part 1**

#### **1. Do you have any feedback on the ACMA’s approach to the five-year spectrum outlook?**

Critical communications infrastructure and public safety communications, including mobile broadband (PSMB) remain a priority for many governments globally.

Year-over-year, Motorola Solutions heavily invests in the research and development of end-to-end systems and solutions designed specifically for the needs and demands of mission-critical communications, emergency services, National Defence, and critical infrastructure services.

Radio networks are essential to government agencies in Australia to improve emergency and day-to-day operational communications. Two-way radios also provide the communication infrastructure for a wide range of industries ranging from agriculture, mining & construction to transportation & hospitality and other essential services. We are also evidencing increased growth in the deployment of private broadband data systems globally to provide mission-critical connectivity to law enforcement agencies and to a wide range of industry and enterprise users custom capabilities that are not otherwise available.

These solutions are key to secure safe and reliable communications and will continue to be an essential part of government entities’ field operations for many years. Spectrum arrangements that prioritize and protect the deployment of these technologies and services should continue to be considered, particularly in:

#### **a) Low-band spectrum**

Considering the importance of low-band spectrum to land mobile users and law enforcement agencies in Australia, we would like to reinforce our views on the ACMA consultation ‘803–960 MHz band: *Implementation of arrangements to support Milestone 3*’.

1. MSI suggests that ACMA designates a public safety mobile broadband (PSMB) allocation consistent with the 3GPP Band 26 arrangement rather than the 3GPP Band 27 arrangement. The uplink band of 3GPP Band 27 is 807-824 MHz, and the downlink is 852-869 MHz. Base stations and mobile handsets supporting Band 27 are required to operate in the 850 MHz expansion band, in particular, sub-band at 809-814 MHz. However, Band 27 is not widely (if ever) implemented in LTE equipment: it was specified in 3GPP for Latin America, but not used so far.
2. The 3GPP Band 27 is not specified as an operating band in 3GPP's NR (5G) standards. However, 3GPP Band 26 (814-849/859-894 MHz) is specified for NR as 3GPP Band n26. Thus, there is a clear migration path from 4G to 5G for Band 26 users that is not available for Band 27, making it unlikely that operators will invest in Band 27. Therefore, the market size is too small to deploy PSMB economically in Band 27, since it is not used anywhere in the world, and has not been prioritized for migration to 5G.
3. 2 MHz of the 850 MHz expansion downlink band, 852-854 MHz, is spectrally located inside 3GPP Band 27 downlink, 852-869 MHz. This means base stations of the land mobile service (LMS) will be transmitting inside the passband of the Band 27 duplexer. Consequently, out of band (OOB) emissions from high power LMS base stations transmitting in frequencies adjacent to 854 MHz may cause interference (blocking) to LTE mobile terminals receiving above 854 MHz. The OOB emissions of LMS base stations transmitting below 852 MHz, outside the downlink of Band 27, will be attenuated by the Band 27 duplexer in the LTE terminal.

To preserve the long-term value of the 850 MHz expansion band, we recommend that allocation of this band should be revised to 814-824/859-869 MHz, with 2x5 MHz for a PSMB network, and 2x5 MHz for spectrum licensing. We also recommend that 806-814/851-859 MHz be reallocated for use by trunked land mobile services. To mitigate interference between narrowband and adjacent broadband networks, we recommend a 1 MHz guard band at 813-814 and at 858-859 MHz, to protect noise-limited land mobile radio (LMR) systems from OOB emissions of adjacent broadband networks. Transmit power from LTE terminals (UE) leaking into the adjacent channel can cause a rise in the noise floor of an LMR base station operating inside the adjacent channel. The guardband also serves to protect broadband systems from OOB emissions of high-power LMR transmitters.

#### b) Mid-band spectrum

We are seeing increased demand for spectrum in the mid-bands, especially for deployment of broadband 5G technologies, ITS, WiFi6e. MSI considers the mid-band spectrum ideal for private broadband networks. We believe private systems and dedicated spectrum will remain important for localized coverage and critical applications that require reliable, resilient service. This arrangement is particularly important to address the needs of the Industry 4.0 and other vertical sectors that are opting to build, own and operate their own networks independent of established, wide-area networks offered by major commercial carriers.

MSI supports the 3700-3800MHz frequency range for localized apparatus licensing.

## Part 2

### **2. Do you have any feedback on the ACMA's plans for monitoring, initial investigation, preliminary replanning or implementation of bands?**

Motorola Solutions strongly supports standards-based technology and spectrum harmonization in major markets in Asia, Europe, and the Americas. Economies of scale generated from harmonization and standards-based technologies enable a significant reduction in consumer prices. The wide use of standards-based technology and spectrum harmonization reduces costs for manufacturers and service providers, maximizes competition, and results in faster technology developments and adoption.

### **3. Do you have any comments about the ACMA's approach to forward allocations?**

There is a strong demand for spectrum and licensing arrangements that enable the deployment of private broadband networks globally. There are currently many examples of private/industry verticals exploring business models that use their own equipment to run their own networks. This is the case with several companies in Oil&Gas, Mining, Industry 4.0, Utilities, and other government entities such as public safety.

Motorola Solutions suggests that ACMA considers spectrum for the aforementioned uses. We recommend that at least 50 MHz dedicated spectrum should be made available between 3400 to 4200 MHz for private broadband systems based on LTE or 5G technologies, through apparatus licensing or another local licensing framework for private networks;

We believe spectrum sharing is key to secure the effective use of such a valuable resource and strongly support ACMA's approach to shared spectrum to maximize the public benefits derived from the efficient use of the spectrum. We recommend that spectrum be made available for private users in all regions: metro, regional, major regional centers, and remote. Such users can share spectrum with incumbents through an automatic frequency coordination system.