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The Manager
Spectrum Licensing Policy
Australian Communications and Media Authority
Online submission

Dear Manager

Submission to Five-year spectrum outlook 2023-28 and 2023-24 work program consultation

I am pleased to provide comment to the Australian Communications and Media Authority (ACMA), on behalf of the NSW Government Telecommunications Authority (NSW Telco Authority), on the *Five-year spectrum outlook 2023-28 and 2023-24 work program - consultation draft* (FYSO).

The NSW Telco Authority is constituted by, and functions under, the *Government Telecommunications Act 2018* (NSW) to operate and maintain mission-critical operational communications services for public safety and government agencies within NSW. The NSW Telco Authority holds responsibility for coordinating telecommunications services support during emergencies under the *State Emergency and Rescue Management Act 1989* (NSW), has a central role in coordinating spectrum holdings on behalf of government agencies and manages major digital connectivity programs for the NSW Government.

NSW Telco Authority provides the following commentary on current spectrum issues relating to the performance of its functions and delivery of its services.

850 MHz expansion band (809-824 MHz and 854-859 MHz)

The Commonwealth has set-aside 2 x 5 MHz (Band 27, 809-814 MHz and 854-859 MHz) for a national Public Safety Mobile Broadband (PSMB) capability. However, there is no existing equipment ecosystem to support the deployment of Band 27, making the band unusable for the PSMB now and for the foreseeable future.

The lead time for the manufacture of equipment capable of operating in Band 27 may be several years and will depend on the interest of major manufacturers to develop both network equipment and a range of end-user devices (including mobile phones and tablets) solely for a relatively small Australian PSMB market. Currently, industry providers have indicated that they have no interest in developing devices or infrastructure for Band 27.

In the absence of any existing international interest or markets for the band for either PSMB or commercial long-term evolution (LTE) services, the cost to Australian emergency services for any bespoke Band 27 equipment, were it to be available, may be considerable and equipment choices limited.

For any PSMB network to be effective, emergency services organisations (ESOs) require immediate and uninterrupted access, at all times to sufficient data throughput to meet their operational requirements. This capacity is constrained by the available spectrum. During early considerations of spectrum for Australian PSMB, modelling of both Australian and international PSMB spectrum requirements demonstrated that a quantum of spectrum greater than 5 + 5 MHz (uplink/downlink) will be required for Australian PSMB to be effective for public safety. This is due to the data capacity of this bandwidth as assessed against the operational requirements of ESOs, where 5 + 5 MHz may be sufficient for business-as-usual operations, but is insufficient for large,

planned safety events or large-scale incidents. ESOs have always sought a greater capacity on this basis.

The counter argument was made by the ACMA that 5 + 5 MHz was sufficient for all, but worst-case public safety scenarios and that high-value spectrum should not remain underutilised by preserving it for rare contingencies. However, it is during those 'rare contingencies', such as bushfires and floods, that the work of ESOs matters most in keeping our people and property safe.

Over time, ESOs have increased, and will continue to increase, their data usage across the range of their public safety activities from business-as-usual to worst case scenario purposes due to a combination of increased adoption of data services by ESOs, technological advancements to support their data-intensive operational activities and population growth.

Contemporary international benchmarking confirms that countries with mature or maturing PSMB capabilities have applied a quantum greater than 5 + 5 MHz for PSMB, whether this be as dedicated spectrum, commercial spectrum or a combination. For example, the United States, Canada, South Korea and Qatar have allocated 10 + 10 MHz of dedicated spectrum for PSMB.

As spectrum is a finite and highly valuable commercial commodity, PSMB must look to either the Australian Government or commercial markets to obtain access to the spectrum required for PSMB.

The NSW Telco Authority, on behalf of NSW ESOs, is continuing to work with other states and territories to identify a path forward to address PSMB's spectrum requirements. Although it is currently unsuitable, this may include the future use of Band 27. While considerations continue, including through consultation with the Commonwealth, it is important that Band 27 remains reserved and available for potential future allocation to PSMB in the absence of any sub-1 GHz alternatives in the foreseeable future.

Review of expiring licences (700 MHz, 850 MHz, 1800 MHz) and spectrum beyond licenced areas

With respect to the current inadequate allocation of spectrum for a national PSMB, there is growing consensus from state and territory representatives that the ACMA should consider a greater allocation of 10 + 10 MHz from the 700 MHz, 850 MHz, or 1800 MHz bands for public safety when licences in these bands expire between 2028 and 2032. 10 + 10 MHz in useable 700 MHz or 850 MHz spectrum would allow for an Australian PSMB comparable to international precedents.

While the Australian Government has allocated an inadequate quantity of usable spectrum for PSMB, other nations (previously mentioned) have taken positive action to ensure that their emergency services have the tools they need to manage emergencies effectively.

For example, in the USA, the Federal Communications Commission issued 'Report and Order DA 12-1462' legislating the provision of an allocation of spectrum from 'the digital television transition' to the PSMB provider FirstNet. Thereby, "the Commission designated twenty-four megahertz of Upper 700 MHz spectrum for public safety services…"

The Commonwealth could similarly take action to ensure adequate spectrum is allocated to an Australian PSMB via broadcast TV spectrum re-allocation to free spectrum for public safety security and protection of life and property in Australia.

When there is no dedicated spectrum available for public safety purposes in Australia the consequences will be increased cost, complexity and delays to the PSMB, something that Australia's first responders and communities can ill afford. The decisions ACMA takes now will either mean the success of PSMB in Australia or sentencing the program to years of delay and complexity.

Also, the NSW Telco Authority notes the recent 'Replanning the 1880-1920 MHz band options paper' and shares the view of the Australasian Railway Association that 1.9 GHz (1900 to 1920 MHz) spectrum should be allocated for Mission Critical (MCX) services within rail corridors to be

used by rail services. This should be in addition to the current allocation of 15 MHz in the 1800 MHz band to allow transition from GSM-R to the Future Railway Mobile Communication System.

Unused spectrum

An allocation of appropriate spectrum for an Australian PSMB could be acquired through spectrum that is currently not used or under-used by licence holders. The NSW Telco Authority would welcome discussions with the ACMA regarding the re-allocation of such spectrum that could be used for public safety purposes.

4.9 GHz (4940–4990 MHz)

There is currently 50 MHz of broadband-ready spectrum in the 4940-4990 MHz band (4.9 GHz band). Since early planning of the Australian PSMB network in 2016, the demand of broadband spectrum has grown within public safety as first responders suffer from the lack of data capability and capacity with the current P25 based Land Mobile Radio for Public Safety in Australia.

By adding this nationwide spectrum to the future PSMB, the NSW Telco Authority would ensure that public safety is able to meet its future spectrum needs. Further, 5G investments will be a priority of the early PSMB investment decisions, which this spectrum could substantially augment.

The Commonwealth may enter into sharing arrangements with public safety entities to use the 4.9 GHz band in support of their missions regarding security and protection of life and property in Australia.

A public safety broadband network using 4.9 GHz spectrum nationwide would leverage the investments made for PSMB for a network toward 5G technologies. The spectrum would provide a logical path forward for the growing demand for spectrum and preserve public safety's ability to evolve as their need for digital communications mature. From an economic standpoint, an entire new market for low latency high bandwidth devices and applications will emerge, allowing for greater competition, innovation and entrepreneurship. We have seen this to be the case with the deployment of FirstNet in USA with over 100 devices and over 100 unique applications currently available to first responders in the USA.

Recently, the NSW Telco Authority provided informal feedback to ACMA about the preservation of this band for ESO purposes in advance of a formal consultation process. This band includes provision at 4940-4990 MHz for public protection and disaster recovery (PPDR) purposes under the *Radiocommunications (Public Safety and Emergency Response) Class Licence 2013* (PSER class licence). This spectrum's inclusion in 3GPP standards makes it increasingly important for ESOs as a 5G element of a PSMB capability, meaning the full 50 MHz should be preserved for the co-existence of both PPDR equipment and 5G PSMB applications. This may require a review of the existing emission mask parameters against 5G application requirements.

NSW ESOs rely on 4.9 GHz spectrum for day-to-day and urgent mission-critical radiocommunications and require the ongoing use of this class licence to save lives and protect property.

ESOs have invested in setting up and maintaining infrastructure that has the capability to meet the requirements to use the 4.9 GHz spectrum band. There are several radio-communicative technologies that the NSW ESOs regularly use, and without these networks, relevant operational data, audio, and visual communications would not be possible. These systems include point-to-point and mesh networks; both of which are used in fixed term and rapid deployments.

Given investment into this ecosystem, ongoing use, and development of fit-for-purpose devices for this band by manufacturers, it is unlikely ESOs would contemplate moving away from the devices used in the 4.9 GHz spectrum. Noting that this class licence is intended to either complement other dedicated public safety and commercial options, or be used as a standalone system, it is often deployed when other communication options are unavailable, providing mission-critical, life-saving communication.

The NSW Telco Authority highly recommends to ACMA to retain the class licence for exclusive use of the 4.9 GHz spectrum for the critical purpose of protecting lives and property.

The PSER class licence currently limits the deployment of a fixed service from a fixed location to six months. While this is aligned with incident-based deployments, consideration should be given to removing this restriction to enable greater flexibility and broader, long-term operational use purposes as part of a PSMB capability.

Similarly, the existing limitation of operating on a maximum of two contiguous channels should be reviewed to enable services requiring greater spectrum concatenation. Consideration should be given to review the 4.9GHz channel arrangement to be in line with the ITU-R M.1826-1. Changing the channel arrangements in this way would simplify device configurations for deployments and facilitate easier coordination between agencies. Adjustments to the 4.9GHz channel to meet the ITU-R M.1826-1 would include:

- Removing the 1 MHz channels between 4945 MHz and 4950 MHz.
- Replacing the removed 1 MHz channels with a single 5 MHz channel with a lower limit of 4945 MHz and upper limit of 4950 MHz.
- Alternatively, removing all 1 MHz channels between 4940-4950 MHz and replacing them with 5 MHz channels.

While the PSER class licence does not provide any regulatory protection from harmful interference by other radiocommunications devices, PSMB communications must be mission-critical. Therefore, a mechanism to support the protection of PSMB communications from interference in this band should be considered.

Deployments could be coordinated by the National Coordinating Committee for Government Radiocommunications representatives, a Network Operations Control Centre or an equivalent authority in each jurisdiction, noting also the requirements relating to potential interference with radio astronomy observations.

NSW ESOs are keen to explore a hybrid licensing approach to allow agencies to allocate parts of the band for fixed long-term or controlled deployments and rapid deployments. This would allow for a coordinated and more efficient use of the band and ensure that there was protection from interference for apparatus licenced parts of the bands. This approach would enhance investments made by ESOs and better address the tactical needs of agencies.

The NSW Telco Authority recognises that ACMA has been developing and implementing another type of licence for spectrum usage in NSW, known as the Area-Wide apparatus Licence (AWL). As this is an emerging area of continued development for ACMA, NSW Telco Authority is keen to discuss what is being considered for this class licence.

3400–3575 MHz and 3700–3800 MHz (metropolitan and surrounding areas) and 3700–3750 MHz (regional areas) and 3750/3800–3950 MHz (regional and metropolitan areas)

NSW Telco Authority would welcome allocation of at least 10+10 MHz in these spectrum bands to address local-area broadband requirements of ESOs that are currently being designed to address existing coverage gaps by network operators. At the moment, ESOs utilise VaaN (Vehicle as a Node) solutions using WiFi frequencies for broadband data needs. Spectrum allocation in this space would better address data requirements of the ESOs by providing a semi-permanent solution to identified high-risk areas with minimal to no mobile coverage (i.e., sections of highways that are prone to vehicular accidents, tourist attractions, beaches, etc.)

Having a dedicated spectrum allocation can provide NSW Telco Authority with an additional site deployment option through a MORAN (Multiple Operator Radio Access Network) agreement with a network operator.

Low-band spectrum

In relation to recent requests to introduce arrangements to access sub-1 GHz bands for WBB use in underground mines, the NSW Telco Authority believes there is high risk of interference to 5G MNO networks. A revised Low Interference Potential Device (LIPD) class licence allowing Wide Broadband (WBB) in mines, using 5G spectrum, would need to include strong protective measures to ensure that there was no interference to above ground networks.

The NSW Telco Authority suggests that a more certain approach to ensuring there is no interference with 5G, would be to restack the targeted bands and provide separate spectrum for use in underground mines. If such a restack were to be undertaken, 10 + 10 MHz of the spectrum should also be considered for a national PSMB, thereby ensuring that ESOs have adequate spectrum to support them to keep Australian communities safe.

400 MHz Harmonised Government Spectrum

While Harmonised Government Spectrum (HGS) is not referenced in the draft FYSO, the NSW Telco Authority raises its interest in consideration of the potential for enabling its use purposes to include LTE. While HGS will continue to focus on land mobile radio networks for voice and narrow-band data communications (P25) in the coming years, the long-term future of this spectrum could evolve to increasingly align with 3GPP technologies, including PSMB services.

13 GHz (12.75-13.25 GHz)

Existing licensees in the 13 GHz band include Commonwealth, State and local governments for point-to-point services. While the ACMA proposes to continue to monitor developments in this band, alternative provisions would need to be made for these existing users should spectrum allocation plans change in the future.

RNSS repeater trials

NSW Telco Authority acknowledges the ACMA's continuing support of RNSS repeater trials in road tunnels being undertaken in NSW under scientific licensing arrangements. The ACMA's proposed plans to consider longer-term licensing solutions to authorise the use of these critical facilities for public safety, emergency management and general transport purposes, including in other environments where GPS location services are otherwise unavailable, should remain a priority for 2023-2024.

Should you wish to discuss this submission, please contact Alison Port, Director Engineering, NSW Telco Authority on [redacted] or email at [redacted]

Yours sincerely

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11/05/2023