

# Submission to the Public Safety Mobile Broadband Productivity Commission Draft Report

Australian Communications and Media  
Authority (ACMA)

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# Response

The Australian Communications and Media Authority (the ACMA) thanks the Productivity Commission for its draft report on the study into securing a mobile broadband capability to meet the long term needs of Australia's public safety agencies (PSAs). The ACMA's role in this process and the spectrum management environment in which it operates is detailed in its previous submission on this matter.

It is the ACMA's view that the methodologies employed in the study are both sound and appropriate in determining the best means to deliver a public safety mobile broadband (PSMB) capability. As far as the ACMA is concerned, the need for PSMB has never been in question, nor has the specified grade of service requirements – these are matters for the Government in consultation with PSAs.

The ACMA supports the Commission's approach of dimensioning the range of PSMB delivery models considered to meet a common benefit, and focussing on the cost-effectiveness of those models. As the ACMA outlined in its previous submission, the ultimate goal should be to deliver and maintain the necessary data capacity in a range of possible operational scenarios. If all delivery models considered are dimensioned to deliver to the necessary grade of service, it is logical that cost effectiveness will be the main point of differentiation between them.

Many of the inputs to the analysis are not matters for the ACMA to comment on. As suggested in the ACMA's previous submission, issues around governance (including interoperability), capability (including capacity, availability, coverage and prioritisation), technology (including public safety-specified equipment availability and voice/data convergence) and business (including procurement and costing) matters have been left to those with relevant expertise.

On matters within the ACMA's scope, draft recommendation 7.2 states that:

*If the Australia Communications and Media Authority allocates spectrum for PSMB, it should be priced at its opportunity cost.*

As detailed in the ACMA's previous submission, the ACMA's approach to pricing is to set prices on a market basis and to respond to directions from the Government if public interest pricing matters are to be considered.<sup>1</sup>

It is noted that the draft report makes no specific findings or recommendations on an allocation of spectrum, although all of the delivery models considered, with the exception of the purely commercial option, would necessitate such an allocation. Even with regard to the purely commercial option, there is some discussion in the report on whether or not the additional load placed on a commercial network by the carriage of PSA traffic would necessitate the acquisition of additional spectrum by the carrier(s).

As noted in the ACMA's previous submission, the key requirement is data capacity, not (just) spectrum. If the pure commercial option is ultimately selected and the service

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<sup>1</sup> For example, in 2009 the ACMA adopted administrative incentive pricing using opportunity cost as the method for administratively allocated spectrum in the 400 MHz band. See <http://www.acma.gov.au/theACMA/acma-issues-for-comment-122009-opportunity-cost-pricing-of-spectrum-public-consultation-on-administrative-pricing-for-spectrum-based-on-opportunity-cost>

provider(s) needs additional capacity to accommodate additional traffic, then that additional data capacity could potentially be secured through any combination of infrastructure investment, technology improvements and/or acquisition of additional spectrum (whether from government sales or the secondary market). The ACMA recently released its *Beyond 2020 – A spectrum management strategy to address the growth in mobile broadband capacity* paper<sup>2</sup>, which describes the relationship between the abovementioned dimensions that can be combined/traded off to deliver mobile broadband capacity.

The ACMA will now await clearer direction on how a PSMB capability will be delivered and what the radiofrequency spectrum implications are, following Government consideration of the Commission's final report. Any decisions on spectrum allocations in support of PSMB, including in the 800 MHz band, will be reserved until this policy direction has been provided.

Appendix A contains some points of clarification on the draft report that are hopefully of use to the Commission.

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<sup>2</sup> <http://www.acma.gov.au/theACMA/About/Events/Spectrum-tune-up-Beyond-2020/beyond-2020>

# Appendix A

Some commentary is provided here on specific aspects of the draft report.

Table 2 (as well as tables in section C.7) includes an opportunity cost estimate of spectrum specifically allocated for PSMB (assuming a dedicated allocation is ultimately required). In the interests of transparency, it would be useful if the final report could include the calculation steps (and any additional assumptions) used to derive the results in Table 2 and section C.7 from the assumptions in Table C.18.

On pages 26-27 (and again on pages 214-216), the draft report discusses the spectrum efficiency benefits that could be realised from the adoption of flexible licensing approaches and spectrum leasing arrangements. The ACMA agrees that measures such as spectrum sharing are important in mitigating increasing demand and encourages efficiency.

It may also be useful to note in the report that different licence types will have varying degrees of scope for mitigating the geographic challenges that might be associated with a dedicated PSMB deployment (assuming this model, or a variation on this model, is ultimately chosen).

For example, when this issue was previously considered by the PSMB Steering Committee (PSMBSC), potential changes to licensing frameworks under the Spectrum Review had not yet been conceived, so that work was done against the backdrop of the current licensing framework, which we now expect to change once the Review is implemented. At the time, it was assumed that a dedicated PSMB solution would be deployed, and the ACMA indicated<sup>3</sup> that area-wide apparatus licences, rather than spectrum licences, would be necessary to provide the flexibility to allow non-public safety users to operate in PSMB-allocated spectrum in areas where PSMB coverage has not yet been (or will not be) deployed.<sup>4</sup>

The reason for this approach was that it would have reflected the reality that a) a dedicated solution would be phased in (geographically) over time, and b) it would not be possible to extend coverage to all areas. It would have ensured that incumbent users weren't displaced unnecessarily and would ultimately optimise the utility of valuable spectrum. Spectrum licensing wouldn't necessarily have provided that level of flexibility.

In any case, licensing frameworks are likely to be soon undergoing significant change, and if there was to be spectrum allocated for a dedicated PSMB capability, access to that spectrum would probably be authorised under a new licence type to be developed as part of the implementation of the Spectrum Review outcomes.

On page 26, the draft report states:

*"In 2012, ACMA made an in-principle decision to set aside 10 MHz of spectrum within the 800 MHz band to support the deployment of a PSMB capability. A final decision on the allocation of this spectrum is yet to be made. However, any state or*

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<sup>3</sup> See section 3.5.1 of the ACMA paper: [Spectrum for public safety radiocommunications – Current ACMA initiatives and decisions](#), October 2012

<sup>4</sup> The potential use of area-based apparatus licences was also noted on page 214 of the draft report.

*territory government that wishes to access spectrum for PSMB is not dependent on the outcome of this process — they can apply to ACMA for an apparatus licence, or obtain a spectrum licence (either at auction or from an existing licence holder).”*

It is true that a state or territory government can apply through ordinary channels to access spectrum outside of a potential PSMB allocation, although there is currently only limited spectrum available for apparatus licensing which may be suitable for mobile broadband. The majority of spectrum that aligns with 3GPP standards for mobile broadband (particularly 4G/LTE) is already designated for spectrum licensing – including spectrum in the 700 MHz band which did not sell at the 2013 spectrum auction and remain unsold – and/or has existing uses. The spectrum in the 800 MHz band which was previously earmarked by the ACMA for a PSMB capability is currently encumbered by other uses and will be repurposed for mobile broadband as part of the broader review of the 803-960 MHz band. Priced based allocation is the usual approach taken by the ACMA to allocate new frequency bands for which demand is expected to exceed supply (which is typically the case for spectrum suitable for mobile broadband use). In addition, the former Minister for Broadband, Communications and the Digital Economy directed the ACMA that the spectrum access charge for the 700 MHz unsold lots must reflect no less than the amount of \$1.36/MHz/pop, appropriately adjusted for duration.<sup>5</sup>

On page 77 of the draft report it states:

*“In carrying out its duties, ACMA prepares a spectrum plan which divides available spectrum into frequency bands. The Australian Radiofrequency Band Plan is the broad level technical map that allocates certain sections of the radiofrequency spectrum to various types of services. The Band Plan is modelled upon and kept in line with the ITU Radio Regulations (ACMA 2013b).”*

The ACMA’s understanding is that the ‘Australian Radiofrequency Band Plan’ mentioned in this paragraph is actually referring to the *Australian Radiofrequency Spectrum Plan 2013* (the Spectrum Plan). It should also be noted that while the majority of the Spectrum Plan is consistent with the ITU-R Radio Regulations, there are some national variations.

Furthermore, the subsequent use of the term ‘band plan’ in this context needs clarification. Band plans are instruments that provide detailed information on service allocations in a specific frequency band, and are therefore a subset of the Spectrum Plan (which provides higher level information for (essentially) the entire radiofrequency spectrum). Band plans can also be issued in two forms: legislatively under the Radiocommunications Act 1992, or administratively in the form of a policy document. The *ACMA planning instruments* webpage<sup>6</sup> contains more information.

Also on page 77 it is stated:

*“As part of a holistic strategy to meet PSAs’ voice, data and video communication needs, ACMA decided to migrate all government radio communications to the 400 MHz band (ACMA 2012a).”*

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<http://www.acma.gov.au/~media/Legal%20Services/Regulation/pdf/Rcomm%20Spectrum%20Access%20Charges%20%20700%20MHz%20Band%20Direction%20No%201%20of%202013%20pdf.pdf>

<sup>6</sup> <http://www.acma.gov.au/theACMA/planning-instruments-acma-fyso-23-1>

A major outcome of the review of the 400 MHz band was to provide a harmonised government segment (HGS) in the band, so as to facilitate national interoperability in accordance with the COAG framework.<sup>7</sup> However, not all government radiocommunications services – including narrowband voice and data – operate in the 400 MHz band (eg. government land mobile services also operate in the VHF mid and high bands), and there is no obligation for government services operating outside the band to migrate to the HGS. In addition, the new HGS allocation is primarily for government agencies providing security, law enforcement and emergency services (defined as ‘tier 1’ users). Other federal, state and territory government users (tier 2 users) can only access the HGS if tier 1 users can be adequately supported.

Lastly, use of the term *government radio communications* is itself somewhat narrowly focussed. The 400 MHz band plan<sup>8</sup> generally only provides for narrowband and some wideband services, and broadband applications such as video streaming cannot be accommodated in this band. Direct (non-cellular) linking of video for public safety purposes would be much better served in the 4.9 GHz band. There are also a myriad of other radiocommunication technologies used by government agencies which, by nature, are generally not suited to the 400 MHz band. For example, Defence, transport, utilities, science and meteorological services, to name a few.

So to clarify, it is incorrect to assert that *all government radio communications* were migrated to the 400 MHz band. The purpose of the 400 MHz review was to harmonise existing government use in the 400 MHz band into a single part of that band, termed the Harmonised Government Spectrum or HGS. Although not mandated, this may also encourage migration of other non-400 MHz government narrowband services into the HGS.

On [page 211](#) it is stated that the 803-960 MHz band is “...often referred to as the 800 MHz band”. This statement is only partially correct. The frequency range known as the 800 MHz band consists of only the lower part of the 803-960 MHz band, being 803-890 MHz. 890-960 MHz is referred to as the 900 MHz band. Historically, prior to the ACMA’s review of the frequency arrangements in these bands, the 900 MHz band referred to the frequency range 820-960 MHz, as reflected in the no longer active 900 MHz legislative band plan (made in 1992). However with the inclusion of 803-820 MHz (vacated by broadcasting services under the *digital dividend* process) and a general shift in accepted industry and international parlance, the 800 and 900 MHz bands are considered as separate frequency bands.

Also on [page 211](#), in describing technologies which could be used in the 4.9 GHz band the draft report included “...*deployable LTE cells*...”. The 4.9 GHz band is currently not included in the LTE standard, so there is not likely to be LTE equipment readily available in this band.<sup>9</sup> However, it is feasible that deployable cells could be used in the 4.9 GHz band for other technologies, such as for portable Wi-Fi hotspots.

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<sup>7</sup> <http://nccgr.govspace.gov.au/files/2012/02/National-Interoperability-Framework-Final.pdf>

<sup>8</sup> <http://www.acma.gov.au/theACMA/400-mhz-plan>

<sup>9</sup> While the 4.9 GHz band is currently not included in the LTE standard, it may be included in future amendments. For example, there are currently efforts to standardise the operation of LTE in “unlicensed” spectrum (see the [3GPP website](#)). Although this work is currently focusing on operation in the 5 GHz band, it is possible that the adjacent 4.9 GHz band could be included in future developments of this technology.

Box 7.7 on page 212 provides a description of the three radiofrequency licensing types currently available: spectrum, apparatus and class licences. Regarding the spectrum licence type, while a spectrum licence does not mandate any particular technologies or services, it does carry specific conditions that prescribe technical limitations.<sup>10</sup> So spectrum licences are technology-flexible, however deployed systems must still adhere to the licence conditions. Consequently, it cannot be said that *any* type of technology can be effectively deployed under a spectrum licence.

It should also be noted that television broadcasting services are provided under the apparatus licence type and are not authorised under the spectrum licensing regime. In addition, spectrum licensees, like apparatus licensees, can authorise third-party operation consistent with the conditions of the licence.

With regards to apparatus licences, while licences *typically* authorise operation at a specific location, some authorise access on an area-wide (in some cases, Australia-wide) basis. Furthermore, the maximum term for an apparatus licence is 5 years, after which it can be renewed.

Regarding class licences, while the type of devices authorised by class licences are generally low-powered, there are some high-powered exceptions.

Also in box 7.7, the draft report states:

*“In addition, transmitter devices must be separately registered and comply with regulations on transmission power levels and out-of-band emissions (to limit interference).”*

The requirements described in the above quote, when applied to a licence, are inherent in the conditions of that licence type, not an additional requirement. In any case, the meaning of this statement and how it applies to the preceding description of the three types of licences appears to lack clarity as these requirements are not consistent across all three licence types. For example, there are often transmitter registration requirements for devices operating under certain spectrum and apparatus licences, but not for class licensed devices. To avoid confusion, Box 7.7 might benefit from removal of the sentence quoted above.

Lastly, throughout the draft report there is discussion on the benefits of international spectrum harmonisation, particularly the enhanced economies of scale that result and international roaming that is enabled. As noted in the draft report, the ACMA actively works to encourage spectrum harmonisation at the international level, including work towards identifying harmonised frequency bands of public safety use.

However, alignment at the frequency band level itself doesn't result in harmonisation. For example, what is termed “the 700 MHz band” in ITU Region 2 (the Americas) does not align with the 700 MHz band in the Asia-Pacific region (ITU Region 3). On page 250 the draft report states:

*“...South Korea announced plans to allocate spectrum in the 700 MHz band, in line with the United States and Canada.”*

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<sup>10</sup> Technical limitations include maximum power, frequency range, out-of-band emissions limits, and geographical licence area.



The latter part of this quote is in fact not true. Both the United States and Canadian public safety allocations align with the 3GPP-standardised band 14 (758-768 MHz paired with 788-798 MHz), while the South Korean allocation is within 3GPP band 28 (703-748 MHz paired with 758-803 MHz). This means that band 14 equipment used in the United States and Canada could not be used in South Korea without modification, which is likely to negate any economy of scale or roaming/interoperability benefits.