

2/12/2022



AMTA Submission

Australian Communications & Media Authority

Automatic sunseting of legislative  
instruments: Proposal to remake  
instruments for the 700 MHz, 1800  
MHz, 2.5 GHz and 2.5 GHz mid-band  
gap spectrum-licensed bands—  
Consultation paper



## About AMTA

The Australian Mobile Telecommunications Association (AMTA) is the peak industry body representing Australia's mobile telecommunications industry. Its mission is to promote an environmentally, socially and economically responsible, successful and sustainable mobile telecommunications industry in Australia, with members including the mobile network operators and service providers, handset manufacturers, network equipment suppliers, retail outlets and other suppliers to the industry. For more details about AMTA, see <http://www.amta.org.au>.



## Introduction

AMTA appreciates the ACMA's initiative in consulting on the remaking of legislative instruments making up the spectrum licensing technical frameworks (SLTF) for the 700 MHz, 1800 MHz, 2.5 GHz and 2.5 GHz mid-band gap bands, and its decision that the instruments are still required and need to be remade.

We also agree with the proposal to update the instruments so that they more closely resemble the SLTF instruments of other bands that were recently updated, like the 2.3 GHz and 3.4 GHz bands—the “non-band specific changes”. In particular, we support the update of the various s145 Determinations (which the ACMA refers to in the consultation paper as ULols) to use a higher resolution digital elevation model (DEM), include exemptions for DBC failures over ocean paths, include a transitional clause and corrections to the Vincenty's direct formulae where necessary.

We are however strongly opposed to the introduction of new protection requirements for 800 MHz apparatus-licensed receivers in the draft *Radiocommunications Advisory Guidelines (Managing Interference from Transmitters – 700 MHz Band) 2023* (the Tx RAG). Where these provisions are introduced as protection requirements, they have the potential to severely restrict registration of 700 MHz base station transmitters around 800 MHz receivers, which in turn can unduly constrain deployment of 700 MHz mobile broadband (MBB) networks for which Australia-wide spectrum licences were purchased by spectrum licensees in 2013.

We also have some other comments on the SLTF instruments in other bands.

## 700 MHz Band

### **AMTA position on 700 MHz Band Tx RAG**

In short, AMTA's position is that spectrum licences should have priority over apparatus licences, regardless of the relative first-in-time status with respect to registrations—given that all migrated (and new) apparatus-licensed services were (or will be) registered after the 2013 Digital Dividend spectrum auction.

Spectrum licensed services should be accorded priority in the resolution of interference disputes for a number of reasons: (a) spectrum licences provide the certainty and exclusivity required for long-term investment in telecommunications infrastructure; (b) spectrum licences are therefore valued highly and attract a commensurate price tag; (c) introducing apparatus-licensed services on co-primary basis after the issuance of a spectrum licence imposes an unreasonable restriction on the spectrum licensee's capacity to utilise the licence that it has paid for; and (d) including interference management measures between co-primary services in RAGs introduces further

uncertainty into the long-term utility of a spectrum licence since RAGs can be amended without the agreement of the spectrum licensees (as opposed to the spectrum licences themselves).

In the lead-up to the 2013 spectrum auction and following the creation of the 2012 SLTF, the 700 MHz band was presented as a band which was unencumbered, apart from the temporary vacation of the band by digital terrestrial television broadcasting (DTTB) services and the adjacent-band management of interference to/from DTTB services below 694 MHz on a permanent basis. When the spectrum was auctioned, there was no mention of apparatus licences above 803 MHz. As a point of principle, AMTA members note that requiring the protection of new apparatus licence services in existing spectrum licence areas has the potential to undermine the investment case and ultimately the deployment of spectrum licensed services.

Since then, the 700 MHz band has been a key part of rolling out 4G LTE services to as many Australians as possible, and being the lowest frequency band currently available for MBB networks, means it is a critical coverage band for the provision of the mobile services to Australians. 4G LTE is still the workhorse for these services prior to the availability of low-band spectrum for 5G NR, and has revolutionised the services available to Australians on their mobile and portable devices, including high-speed internet and audio and video streaming not possible with previous generations of mobile. The massive investments made by MNOs in acquiring the “digital dividend” spectrum—a total of \$1.9 billion from the sale of 700 MHz and 2.5 GHz bands—amply reflect that MBB is the highest-value use (HVU) of the band.

In comparison, 800/900 MHz apparatus-licensed services are relatively low in number (hundreds) providing certain specific services as opposed to the primary critical communications links that exist in the 400 MHz band (thousands). Also, and particularly for the fixed point to point (P-P) links and trunked land mobile services (TLMS) in the 800 MHz Band, alternative spectrum options exist—with the much more popular 400 MHz band supporting narrowband P-P links and TLMS, and microwave P-P links providing options for higher-capacity P-P links in a number of frequency bands above 6 GHz. More detail on this below.

In our view, spectrum licences provide holders with rights that dictate they be afforded a high degree of certainty and exclusivity over the use of their spectrum. To require spectrum licensees to subsequently expend resources and costs to protect and coordinate with new apparatus licensees—and in particular to potentially obstruct deployment at key sites—within spectrum licence areas is not consistent with our understanding of the priority afforded to spectrum licensees in ACMA policy, for example as outlined in the ACMA’s paper *Our approach to radcomms licensing and allocation*<sup>1</sup>.

---

<sup>1</sup> ACMA, March 2021, *Our approach to radiocommunications licensing and allocation—Implementing the Radiocommunications Legislation Amendment (Reform and Modernisation) Act 2020*, available here: [https://www.acma.gov.au/sites/default/files/2021-06/Our\\_approach\\_to\\_radcomms\\_licensing\\_and\\_allocation\\_information\\_paper.pdf](https://www.acma.gov.au/sites/default/files/2021-06/Our_approach_to_radcomms_licensing_and_allocation_information_paper.pdf)

AMTA members have observed a recent trend with which various apparatus-licensed (and even class-licensed) applications are being considered by the ACMA with an elevated priority which has the effect of diluting spectrum licence rights. This erosion of spectrum licence rights in turn reduces the value of the spectrum.

The issue under discussion in the 700 MHz is an example of this: introducing reciprocal coordination requirements between spectrum-licensed base stations and apparatus-licensed stations essentially grants both types of services the same status, despite the hugely disparate investments to access the spectrum and public benefit associated with each licence type. The 700 MHz spectrum licences are Australia-wide licences which afford licensees with rights to deploy nationally. Adding new protection requirements which can prevent deployment introduces an unacceptable level of uncertainty into network rollout investment plans. This in turn clearly undermines the investment, reduces the value of the 700 MHz spectrum—for which the HVU is still MBB—and risks this HVU not being met.

As such, AMTA submits that the inclusion of requirements to protect adjacent-band apparatus-licensed services in the Tx RAG is unacceptable.

### **AMTA proposed compromise**

Of course, it is not the intention of any of the mobile network operators (MNOs) to disrupt services and cause interference to fixed links and land mobile services mid-operation. We understand that to date, there have been no reports of interference on either the spectrum licensed or apparatus licensed services. As such and as a very substantial compromise, we would suggest that notification requirements (as opposed to protection requirements) could be included in the Tx RAG such that Accredited Persons (APs) can trigger a notification on existing nearby apparatus-licensed receivers so that the corresponding apparatus licensee can choose to take appropriate measures. Any mitigation measures—including filtering or moving to another band—can be implemented unilaterally by the apparatus licensee. However, under no circumstances is the spectrum licensee to be prevented from registering a base station in order to protect the adjacent-band apparatus-licensed service.

In our submission dated 7 July 2022, we advocated for removal of Parts 6 and 7 of the Tx RAG in their entirety. In line with the compromise notification approach proposed above, spectrum licensees would be able to deploy within the defined area as needed, subject to notifying affected apparatus licensees. However, the wording of Part 6 clause 15(2), and Part 7 clauses 17(2), 18(2) and 18(3), of the Tx RAG, need to be amended such that the clauses only refer to notification requirements.

As mentioned above, this is a substantial compromise offered on behalf of the spectrum licensees, which will incur significant costs in performing the calculations to identify potentially-affected apparatus licensees in accordance with the criteria of the relevant RALIs. Currently, 700 MHz base stations can be registered with no detailed coordination calculations involving existing receivers, so the variation of the Tx RAG to implement the notification requirements represents a completely new obligation and significant costs for spectrum licensees. However, as stated above, of utmost

priority is to avoid the constraining of network deployment, which will have real impacts on the coverage provided to users in the critical coverage band for MBB.

## Co-primary services

We note that ACMA's statement: *"As stated in section 7 of the Australian Radiofrequency Spectrum Plan 2021 (the spectrum plan), services operating under a spectrum licence are taken to be a primary service unless the spectrum licence specifies otherwise. This provides devices operating under a spectrum licence the same status as other primary services defined in the spectrum plan. Other co-primary services could be authorised under another spectrum or apparatus licence and could operate on in-band or adjacent band frequencies. Guidance on how to manage interference with other co-primary (and secondary) services is provided in the RAGs."*

We are not sure as to the intent of this sentence, but we interpret it as the ACMA attempting to explain that the 800 MHz band services are co-primary to the 700 MHz spectrum-licensed services and therefore have equal priority. If this is the case, we believe the reference to the Section 7 of the Australian Radiofrequency Spectrum Plan 2021 ("the ARSP") is slightly misleading. This section is not saying that spectrum licences are on equal footing with apparatus-licensed services that belong to the service type to which the band is allocated on a primary basis. Rather, section 7 (and 9(1) of the ARSP) ensure that spectrum licences can (a) achieve their objective of being technology-agnostic and flexible in terms of the uses supported by not being in contravention of the ARSP (section 9(1)), and (b) maintain their certainty and exclusivity even if the corresponding service has a secondary allocation (or no allocation) in the ARSP (section 7).

For context, it is important that radiocommunications services be compliant with the ARSP, and this appears in certain parts of the *Radiocommunications Act 1992* ("the Act"). For example, the ACMA is not permitted to make marketing plans for re-allocation of spectrum (s39A of the Act) or issue apparatus licences (s104 of the Act) that are inconsistent with the ARSP. In general terms, this means that the ACMA cannot issue licences in a particular band for a type of service to which that band is not allocated, as that would be in contravention of the ARSP. However, for radiocommunications services authorised by spectrum licences:

- a) Section 9(1) of the ARSP provides the ACMA with an exemption to this, such that any service operating under a spectrum licence is not inconsistent with the ARSP, regardless of whether the band is allocated to that service or not.
- b) if the corresponding allocation of the service type is secondary, section 7 of the ARSP confirms that the service is not to be considered secondary—rather, it's to be considered primary—since it is operating under a spectrum licence.

Because the 700 MHz band 703-803 MHz is already allocated to the Mobile service on a primary basis, section 7 of the ARSP is irrelevant. The interaction between spectrum-licensed and apparatus-licensed services goes beyond the ARSP and is a matter for ACMA policy. We believe that the ACMA policy decision should be to prioritise spectrum-licensed services for the reasons outlined in the section titled "AMTA position on 700 MHz Band Tx RAG".

## **Overview of 800 MHz apparatus-licensed receivers**

AMTA has reviewed the existing 800 MHz P-P links in 803-806 MHz and found that there is a relatively small number of links, compared to the 400 MHz and microwave bands: just 185 Fixed Point to Point licences (only one bi-directional link per licence). Of the 185, 87 have 12.5 kHz or 25 kHz bandwidths; narrowband links which can be supported in the 400 MHz Band. There are however 94 wideband fixed links with 75-200 kHz (vast majority 200 kHz). 2/3 of these are in NSW, and the majority are held by government agencies.

Compared to microwave bands, UHF does provide longer propagation, and in that sense, we do recognise that the provision of 200 kHz channels in the 800 MHz range is a unique arrangement. However, only approximately 25 links are 50 km or longer, and only 16 links are 60 km or longer. Links shorter than this can easily be supported at microwave frequencies; particularly with lower-order, more robust modulation schemes (e.g. QPSK). The fact that the UHF links in question only have 200 kHz bandwidths means that there should be no problem achieving the same capacity within the channel widths available for microwave links even with more robust modulation, noting that the minimum channel width in microwave bands is 7 MHz.

Furthermore, it should be noted that the ACMA recently completed a pricing review which resulted in significant reductions in licence tax. The licence tax associated with microwave links used to present a significant cost in the past, particularly to lower-frequency links in high density areas. However, these have now been reduced by 50% above 5 GHz, and by 90% above 8.5 GHz.

For the remaining links in the 900 MHz band which have still not migrated, the relevant licensees should be advised of the newly-identified risks associated with the 800 MHz band so that they can re-assess what to do with their existing links, noting that the compliance date of 30 June 2021 for migration to the 800 MHz band was almost 18 months ago.

The fact that compatibility between 700 MHz and 800 MHz band services was not considered in the 800 MHz re-planning exercise starting in 2015 represents a major oversight on the part of the ACMA and the broader industry. As such, the ACMA should not shy away from changing decisions previously made in regards to 800 MHz apparatus-licensed services. It is less damaging to change these decisions than to cripple the 700 MHz spectrum licensed band which constitutes both the critical coverage band for MBB services to Australians, the HVU of this range of spectrum, and a billion-dollar spectrum investment by MNOs.

## Compatibility with 800 MHz PTA base station receivers

AMTA is particularly concerned about the imposition of protection requirements for “point-to-area” (PTA) type services including TLMS base station receivers and P-MP hub station receivers. As opposed to fixed P-P links, TLMS base station receivers have:

- a) omnidirectional antennas meaning the potential spectrum denial around a TLMS receiver extends in all directions/azimuths; and
- b) unpredictable wanted signal levels—since they are receiving signals from mobile stations which could be anywhere within the coverage area—therefore wanted-to-unwanted (W/U) signal ratio calculations—commonly used for assessment of interference to fixed P-P links—are not practicable. Consequently, the protection criterion is an interference-to-noise (I/N)-style threshold (-121 dBm for 12.5- and 25-kHz services in RALI LM8).

The non-spurious unwanted emission limits in the 700 MHz spectrum licence core conditions, applicable to upper-band base station transmitters, are specified in Table 4 (for emissions below 806 MHz) and Table 5 (for emissions above 806 MHz). In the TLMS base receive segment 806-809 MHz, the applicable emission limit is -6 dBm/MHz EIRP. -6 dBm/MHz EIRP is equivalent to -22 dBm/(25 kHz) EIRP, still approx. 100 dB above the LM8 interference threshold. At 800 MHz, free space loss (FSL) doesn’t reach 100 dB until approx. 3 km.

We further note that—with the exception of Tasmanian and WA Police agencies which have more geographically-widespread networks—the majority of 800 MHz TLMS licences are in metropolitan areas. The imposition of new protection requirements that could lead to spectrum denial to 700 MHz networks within a 3 km radius is a completely unacceptable notion.

Lastly, P-MP systems present the “worst of both worlds”, with omnidirectional antennas, a fixed interference threshold, but is also below 806 MHz and therefore exposed to higher unwanted emission levels according to 700 MHz spectrum licence unwanted emission limits. These systems are currently very low in number (23) and any future systems should be issued only on an opportunistic or “best efforts” no-protection basis.



## 2.5 GHz Tx RAG

In the *Radiocommunications Advisory Guidelines (Managing Interference from Transmitters – 2.5 GHz Band) 2012* (2.5 GHz Tx RAG), Part 7 “Radiodetermination services receivers” specifies that 2.5 GHz spectrum licensees must protect radar receivers operating in the band 2700-2900 MHz. The current version of the 2.5 GHz Tx RAG notes that *“currently there is no RALI describing coordination requirement with the [aeronautical radionavigation/radiolocation] service in the band 2700 to 2900 MHz but such a RALI could be developed in the future”*. These sentences correctly reflect the situation, and the addition of the reference to the Recommendation ITU-R M.1849 does not change this. As such, we recommend that these sentences noting the absence of an appropriate RALI remain in the 2.5 GHz Tx RAG.

While ITU-R Recommendations do contain certain technical characteristics and protection criteria which can guide licensees and Accredited Persons (APs) to develop appropriate calculations and exercise engineering judgement, however our understanding is that these are not the hard protection criteria above which interference cannot be tolerated, and there is room for negotiation between spectrum licensees and radar operators.

Australian Mobile  
Telecommunications Association

PO Box 1507, North Sydney, NSW 2059

50 Berry St, Suite 504, Level 5, North Sydney NSW 2060

[www.amta.org.au](http://www.amta.org.au)