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AMTA Submission

Australian Communications & Media Authority

# Remaking instruments for 3.4 GHz spectrum-licensed band— 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 strongly supports the ACMA’s proposal to remake the three legislative instruments comprising the 3.4 GHz spectrum licence technical framework (SLTF).

We note that the ACMA:

- flags that they have proposed updates to the structure and formatting of the SLTF instruments to align with those of other bands (to ensure consistency across bands); and
- also proposes to remove certain elements already in the *Radiocommunications (Interpretation — Technical Framework) Determination 2024* (“the ITFD”), within which elements that are common to multiple spectrum-licensed bands are intended to be consolidated.

That said, the consultation paper is light on detail and for all three SLTF instruments notes that there are “no band-specific changes” proposed, with the exception of two new sections in the draft *Radiocommunications Advisory Guidelines (Managing Interference from Spectrum Licensed Transmitters—3.4 GHz Band) 2025* (“Tx RAG”). However, we found multiple non-trivial changes throughout the three documents, and we believe that these should have been explained, or at the very least highlighted, in the consultation paper.

## AMTA views on draft changes to the 3.4 GHz SLTF

### Unacceptable Levels of Interference (ULoI) Determination

#### *Part 7—“Unacceptable levels of interference”*

The ACMA explains that there are no substantive changes to section 7<sup>1</sup>. However, we were concerned about the addition of a new exception where the device boundary (DB) “*is connected to a radial that does not cross over the geographic area of another 3.4 GHz spectrum licence*” in 7(5)(d)(ii) for parts of the DB spilling into an Urban Excise area within 3400-3475 MHz. Following correspondence with the ACMA<sup>2</sup>, we understand the scenario the ACMA is attempting to accommodate with these changes. Absent the email correspondence and explanation, this was potentially a non-trivial change. In the future, when the ACMA is putting additional clauses into legislative instruments, even if they appear to be “not substantive”, we ask that an explanation for the change is included in the consultation paper.

Lastly, we note that registration-exempt transmitters are not required to meet the device boundary criterion (DBC), which is mentioned in a Note: “*However, some radiocommunications*

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<sup>1</sup> Consultation paper, top of p.6.

<sup>2</sup> Via email, 27 and 28 May, 2025.

*transmitters are exempt from the requirement to be registered in the Register under their 3.4 GHz spectrum licence – see subsection 69(2) of the Act. Accordingly, these transmitters are not required to meet the device boundary criterion specified in this instrument”. We believe that this exemption should be explicitly stated in its own clause within section 7, not just in the Note.*

## **Transmitter RAG**

Part 2 lists the different type of receivers that are addressed in the Tx RAG, including the point to multipoint (P-MP) services in 3400-4000 MHz in Part 11 and frequency-adjacent area wide licences (AWLs) in Part 12, as highlighted in the consultation paper. We also support the clarifying statements that *“the ACMA may take this instrument into account in determining whether a 3.4 GHz transmitter is causing interference to an apparatus licensed or class licensed radiocommunications receiver”* and *“This instrument does not prevent a person negotiating and implementing other protection requirements with other persons”*. These statements are helpful and help to define the purpose of the Tx RAG.

### ***Editorial changes***

There are potential editorial changes to the draft Tx RAG which we believe could be considered by the ACMA:

- the acronyms “FSS” (for fixed-satellite service), “ESPZ” (for earth station protection zones), and “AWL” (for area wide licences), be retained;
- the word ‘for’ in the expression *“not to be exceeded for more than 20% of the time”* should be retained;
- a few typographical errors: “install”, “pattern”, “calculated basic transmission loss”;
- the expression *“not taken to cause”* should be replaced with *“taken not to cause”*;
- the expression *“will not generally be issued”* should be replaced with *“will generally not be issued”*;
- either *“area wide licence”* or *“area-wide licence”* (hyphenated) should be used, but not a mix of both.

### ***Substantial changes***

There are some changes of more substance that we submit for the ACMA’s consideration:

- Part 11 “Frequency-adjacent wireless broadband services in 3400 MHz to 4000 MHz”: the title should be changed to *“Highly localised wireless broadband services under fixed point to multipoint licences”*, for two reasons. Firstly, it clarifies that this section deals with HL WBB services under P-MP licences, as opposed to other WBB services (e.g. under AWLs or under legacy P-MP licences). Secondly, clause 28(3) specifically deals with mandated synchronisation with the co-channel, adjacent-area spectrum licences currently held by NBN Co. As such, the deletion of “frequency-adjacent” from the title is appropriate.

- In this regard, adding the words “co-channel” to the description of “~~a~~ co-channel, adjacent area 3.4 GHz band spectrum licence in certain circumstances” may be clearer.
- Furthermore, it would be beneficial for industry to see the final version of RALI MS 50 as part of this consultation process to see if any of what is in that RALI might impact what needs to be in the Tx RAG (or the Rx RAG for that matter).
- Section 28(2) notes that P-MP systems in the 3400-3475 MHz range are not afforded protection from interference from a 3.4 GHz transmitter. We would like this provision to clarify that P-MP systems in 3950-4000 MHz are similarly afforded no protection from 3.4 GHz spectrum-licensed transmitters.
- Part 12—Frequency-adjacent AWL in 3400-4000 MHz: *“These arrangements note that [AWLs] will not generally be issued in the 15 MHz of spectrum directly adjacent to a 3.4 GHz band spectrum licence in the same geographical area.”*
- Part 14—Aeronautical service: *“**non-exempt AWL tx transmitter** is taken to be a reference to a 3.4 GHz transmitter operated, or proposed to be operated, in the 3700 MHz to 3800 MHz frequency band, and that is not exempt from the requirement to be registered by a statutory condition of its 3.4 GHz spectrum licence.”* This change is necessary to clarify that registration-exempt transmitters are not subject to these protection requirements in RALI MS 47.

Furthermore, we note the following deletions which we do not consider to be minor editorial changes, but that the ACMA did not identify or adequately explain in the consultation paper:

- Section 14 of Part 4 “Protection requirements – fixed-satellite service earth receive stations under area-wide receive licences in 3750 MHz to 4000 MHz”: for the notification requirements in subsection (8), the time limit of until 16 July 2027 has been removed, with the effect that these notification requirements will remain beyond that date. We are interested to know the motivation behind and the justification for this.
- Explanatory notes regarding the earth station facility at Uralla. We are interested if there has been some update regarding the nature of the services at this facility and/or if the ACMA has further considered the long-term viability of the facility. If so, these should have been outlined in the consultation paper. If not, then the notes should be retained.

## Receiver RAG

### Part 2—Overview

We support the addition of the clarification that *“this instrument... (c) sets out minimum receiver performance requirements that the ACMA will assume are met by a radiocommunications receiver, when considering whether to provide protection to the receiver in accordance with this instrument, so that the onus of managing interference is not solely placed upon the operators of radiocommunications transmitters”*.

### Part 3—Managing interference from other services

We have a few comments on section 8 dealing with in-band interference:

- Subsection 8(1) deals with interference from a transmitter under an adjacent (co-channel) spectrum licence. The draft Rx RAG proposes to change *“and deployment constraints prescribed in the subsection 145(4) Determination”* to *“and any deployment constraints in RALI MS 47”*. This proposed change is non-trivial but it was not identified in the consultation paper. Furthermore,
  - Attempting to distinguish the DBC applicable to spectrum licensed transmitters and the DBC applicable to AWL transmitters in the definition in Part 1 is a bit confusing; we think it’s clearer to simply refer to the s145 Determination or RALI MS 47 in-line.
  - We are not aware of any deployment constraints in RALI MS 47 that apply to spectrum-licensed transmitters that are directly intended to facilitate co-channel coexistence with receivers operated by adjacent spectrum licensees.
  - *“... and any deployment constraints in RALI MS 47”* could be replaced with a reference to the Tx RAG (specifically, Part 8 of the Tx RAG).
- Subsection 8(2) deals with interference from an apparatus/transmitter licence. The wording *“is managed by the device boundary criterion [as per RALI MS 47] as if the transmitter were operated under an area-wide licence”* is confusing, as it seems to exclude transmitters authorised by AWLs, and also makes it sound like there are arrangements for non-AWL apparatus-licensed transmitters in 3400-3800 MHz. From our review of RALI MS 47, the only new apparatus-licensed transmitters that would be permitted in 3400-3800 MHz are fixed P-MP licences outside the ASMG. This is bearing in mind that: (a) new fixed P-P licences are not permitted below 3800 MHz and (b) interference from legacy apparatus-licensed transmitters is not managed with the RALI MS 47 DBC. Furthermore, the statement becomes outright incorrect when we consider that co-channel interference from HL WBB P-MP licences in 3400-3475 MHz will not be managed by the RALI MS 47 DBC. As such, we would recommend reviewing this section as follows:

*Subject to subsections (3) and (4), in-band interference to a 3.4 GHz receiver, caused by a radiocommunications transmitter operated under a transmitter licence, is managed as follows:*

- (a) if the transmitter licence is an area wide licence, by the device boundary criterion of RALI MS 47,*
- (b) if the transmitter licence a fixed licence for a radiocommunications transmitter located outside the Australian Spectrum Map Grid, by the device boundary criterion of RALI MS 47, as if the transmitter were operated under an area-wide licence, and*
- (c) if the transmitter licence is a fixed point to multipoint licence authorising a highly-localised wireless broadband service in 3400-3475 MHz, by the provisions of RALI MS 50.*

*It should be noted that in general, no other type of transmitter licence would be issued in 3400-3800 MHz, in accordance with RALI MS 47.*

### **Part 5—Compatibility requirement**

We support the modifications that the ACMA proposes in this section, which add both more clarity and also correctness around the application of the concept of the compatibility requirement and how it differs from the notional receiver performance level.

The ACMA proposes to add a new subsection 13(1) stating *“In relation to a fixed receiver specified in subsection (2), the licensee of a fixed transmitter operated under an apparatus licence or a spectrum licence must ensure that the transmitter meets the compatibility requirement in item 1 of Schedule 2”*. We support this addition.

Wording in the current Rx RAG refers to the receiver “meeting” the compatibility requirement, which is not a useful concept, since the receiver has to meet the notional performance, not the compatibility requirement. Rather, it is other transmitters which have to protect receiver by complying with the compatibility requirement. Accordingly, the ACMA’s proposed changes, in 13(1), refer to the *transmitter* meeting the compatibility requirement. To be afforded protection, the receiver is identified as a “specified receiver”, if it is (a) operated under a spectrum licence; (b) satisfying the notional receiver performance and (c) registered first-in-time. We welcome and support the proposed changes in this section.

### **Schedule 1—Notional receiver performance level**

We welcome and support the updates in general, which organise the various values into tables and include references to 3GPP specifications. However, we note the following inconsistencies:

1. Adjacent channel selectivity (ACS) is presented as a **ratio** between the [maximum tolerable] received unwanted signal power in the adjacent (interferer’s) channel and the receiver’s sensitivity level, while intermodulation response rejection and receiver blocking are presented as **absolute values** of the [maximum tolerable] received unwanted signal power, of an unwanted intermodulation product or signal. We propose that ACS be

defined using an absolute value, both for internal consistency and to directly reflect the 3GPP technical specifications.

2. The explanatory notes under intermodulation response rejection and receiver blocking—stating that the values presented are ratios—are incorrect, since absolute values are being listed.
3. The section on receiver blocking erroneously refers to the 2.3 GHz band and the associated edges of the boundaries for in-band blocking (i.e. 2280 MHz and 2420 MHz).

Notwithstanding our comment in point #1 above, we note that for certain calculations, it is useful to have receiver selectivity levels defined as ratios. As such, we support the revision of the explanatory footnotes such that they outline how to derive the ratios between the absolute values and the receiver sensitivity levels.

Proposed edits:

- In item 1 of Schedule 1 “Notional receiver performance level”, add a source note: *“ $P_{REFSENS}$  from Table 7.2.2-1 of 3GPP TS 38.104 V18.9.0 (2025-03): NR Wide Area BS reference sensitivity levels, plus a margin of 6 dB, and rounded to the nearest integer dBm”.*
- In item 2 of Schedule 1 “Adjacent channel selectivity”,
  - In the table, in the header row, third column, replace “Minimum relative adjacent channel selectivity (dB)” with “Minimum adjacent channel selectivity requirement (dBm)”;
  - In the table, in the row corresponding to 0-20 MHz bandwidths, replace 45 dB with -52 dBm;
  - In the table, in the row corresponding to bandwidths > 20 MHz, replace 45 dB with -52 dBm;
  - Under the table, for the source can replace V17.5.0 (2022-04) with V18.9.0 (2025-03);
  - Under the table, change the Note to “For the purposes of developing receiver selectivity masks, the values in the table above can be converted to a ratio of 44 dB for receivers with bandwidths up to (and including) 20 MHz, and a ratio of 37 dB for receivers with bandwidths greater than 20 MHz. These levels are derived by subtracting the ACS requirement from the corresponding  $P_{REFSENS}+6$  dB value.”.
- In item 3 of Schedule 1 “Intermodulation response rejection”,
  - Modify subsection (2) as follows: “The intermodulation response rejection is to be such that an out-of-band signals received at greater than or equal to -52 dBm per occupied bandwidth for each out-of-band signal, at frequency offsets at least 5 MHz from the upper and lower frequency limit of the spectrum licence, can be tolerated.”



- Under subsection (2), change the Note to “*The value above can be converted to an intermodulation response rejection ratio of 44 dB for receivers with bandwidths up to (and including) 20 MHz, and a ratio of 37 dB for receivers with bandwidths greater than 20 MHz. These levels are derived by subtracting the requirement from the corresponding  $P_{\text{REFSENS}}+6$  dB value.*”
- Add a source note: “*General intermodulation requirement from Table 7.7.2-1 of 3GPP TS 38.104 V18.9.0 (2025-03)*”.
- In item 4 of Schedule 1 “Receiver blocking”,
  - Modify subsection (1) as follows: “*For radiocommunications receivers operating in the 3.4 GHz band, at frequencies in the 3340 MHz to 3860 MHz frequency range, a receiver blocking level greater than or equal to the following figures ~~above the sensitivity level~~ for interfering signals in the frequency ranges set out below is required:*”
  - Under the table, for the source can replace V17.5.0 (2022-04) with V18.9.0 (2025-03);
  - Under the table, change the Note to “*For the purposes of developing receiver selectivity masks, the values in the table above can be converted to a ratio of 53 dB for receivers with bandwidths up to (and including) 20 MHz, and a ratio of 46 dB for receivers with bandwidths greater than 20 MHz. These levels are derived by subtracting the in-band blocking requirement from the corresponding  $P_{\text{REFSENS}}+6$  dB value.*”.

## **Schedule 2—Compatibility requirement**

We support the clarification that the compatibility requirement is “*to be provided by a radiocommunications transmitter operated under a transmitter licence or a spectrum licence*”, and we also support the change for the compatibility requirement to be defined as a “maximum unwanted signal level” instead of a “minimum wanted signal level”. With such a change to this definition, the magnitude of the compatibility requirement (in dBm per 5 MHz) also needs to be adjusted to reflect this: from -95.5 dBm per 5 MHz, **to -108 dBm per 5 MHz**. Now that the compatibility requirement is defined as a maximum unwanted signal level, the wanted to unwanted ratio of 12.5 dB in subsection (1)(b) can be deleted. We note that the change from wanted to unwanted signal is non-trivial and should have been identified in the consultation paper.

## Annex—Immediate changes to the 3.4 GHz band

In its work to re-make the legislative instruments for the 3.4 GHz SLTF, we wish to reiterate our requests for the ACMA to consider in relation to this band. These have been reproduced here in this annex.

We note that the ACMA has completed the first three of four allocations in this frequency range—i.e. 3.4-4.0 GHz Remote AWLs, 3.4/3.7 GHz spectrum licence auctions, 3.8 GHz metro and regional AWLs. Only the introduction of arrangements for highly-localised (HL WBB) services remains, and the ACMA has reiterated its commitment to open the band for over-the-counter apparatus licence applications this quarter (Q2 2025).

Noting that (a) there is considerable unmet demand with 3.8 GHz AWLs in metro areas, and (b) that the introduction of HL WBB would further complicate any future defragmentation process, we ask that the ACMA **consider delaying these new HL WBB arrangements** until a more holistic consideration of the overall 3.4-4.2 GHz band can be undertaken, in light of the potential for future use of 4.0-4.2 GHz<sup>3</sup>.

As already requested in last year's FYSO response, there are some initial changes that can be made in 2025 to remove discrepancies in the spectrum licence (SL) product among different parts of the 3.4-3.8 GHz range, which will in turn facilitate (and are crucial for) the defragmentation discussed in more detail further below. These are as follows:

- A. For the 3.4 GHz SL unwanted emission limits, the frequency edge above which spurious emission limits apply (i.e. the “spurious domain edge”) needs to move from 3840 MHz to 4040 MHz<sup>4</sup>.
- B. Also, for the 3.4 GHz SL unwanted emission limits, the SLs need to define some allowance to be able to exceed these, for example, by agreement. If the same-area, adjacent-frequency AWL licensee agrees, then there should be no reason for the spectrum licensee to have to comply with the unwanted emission limit within the licensed frequency range of the licensee(s) with which the agreement was made<sup>5</sup>.
- C. HL WBB apparatus licences—both those within the “Urban Excise” areas in 3400-3475 MHz and those in 3950-4000 MHz—are to expire no later than 13 December 2030, and

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<sup>3</sup> Pivotal has different views on this issue.

<sup>4</sup> AMTA first wrote to the Executive Manager of the ACMA's Spectrum Planning & Engineering Branch (SPEB) on this matter on 22 December 2023.

<sup>5</sup> Note: the ACMA's document *Know your obligations—Spectrum licensees* (available here: <https://www.acma.gov.au/sites/default/files/2019-08/Know-your-obligations-Spectrum-Licensing.pdf>) already states that outside-the-band emission limits “*may be varied through negotiated agreement with affected adjacent licensees*”. However, section 4.1.6 of this document clarifies that “*Agreements cannot be used to authorise the operation of devices: ... with emission limits outside a designated spectrum-licensed band greater than the limit specified in the spectrum licence*”.

include a renewal statement—made under section 103A of the the Act—that renewal will not be offered beyond this date<sup>6</sup>.

D. With respect to Radio Altimeters (RAs):

- a. We implore the ACMA to continue to engage with CASA, to ensure that the aviation industry takes the necessary actions to upgrade its RA equipment, such that the interim measures can be lifted within the timeframe.
- b. The EIRP limit of 72 dBm/5MHz currently imposed on SLs in the range 3700-3800 MHz must be removed<sup>7</sup>.

E. Introduce Power Class 1 / Power Class 1.5 higher-powered devices into the band by lifting the registration exemption threshold<sup>8</sup>.

Both changes A and B above are required to support *inter alia*, the use of shared network infrastructure (such as Open RAN/Neutral hosts), and to support scenarios in which a SL licensee holds an immediately adjacent-frequency AWL in the same area.

Changes C and D above are required to ensure that the value of the spectrum product in one part of the band is more or less the same as that in other parts of the spectrum, thereby facilitating and encouraging spectrum trading with a view to achieving defragmentation. Undue restrictions in a particular part of the band undermine this.

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<sup>6</sup> AMTA has submitted this view to the ACMA in its response to the TLG Paper V1 on the *Arrangements for highly localised WBB in the 3400-3475 MHz and 3950-4000 MHz bands*, dated 16 February 2024.

<sup>7</sup> AMTA wrote to the Executive Manager of the ACMA's SPEB on this matter on 23 October 2023.

<sup>8</sup> AMTA members anticipate a requirement to enable higher-powered user equipment (HPUE) in the 3.6 GHz band for fixed wireless access. We note the registration exemption threshold for user equipment is 28 dBm TRP, and we observe that 3GPP Power Class 1.5 (PC-1.5) is 29 dBm TRP and 3GPP Power Class 1 (PC-1) is 31 dBm TRP.

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