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AMTA Submission

Australian Communications & Media Authority

Area-wide apparatus licences in the 3.8
GHz band in Metro & Regional
Australia
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>.



Executive Summary

AMTA appreciates the opportunity to comment on the ACMA's *Allocation of area-wide apparatus licences in the 3.8 GHz band consultation process*, including the *Area-wide apparatus licences in the 3.8 GHz band in metropolitan and regional Australia—Licensing, allocation process, technical framework and pricing arrangements—Consultation paper* June 2023 (“the consultation paper”) and the accompanying draft revision of Radiocommunications Assignment & Licensing Instructions (RALI) MS47. We are generally supportive of the ACMA's proposed approach and draft revision of RALI MS47.

In particular, we support:

- a) the proposed restriction of Area Wide Licence (AWL) licensing periods such that they cannot expire later than 13 December 2030 (the expiry of 3.4 GHz spectrum licences);
- b) the ACMA's proposed approach to renewals—i.e. not including a renewal statement but including an advisory note regarding the assessment of (i) whether or not there is unmet demand in the band; and (ii) whether or not the existing AWL has been used; and
- c) Option 2 for the allocation approach¹.

AMTA understands that the consultation process is also for the purposes of the ACCC formulating its advice on allocation limits and consents to this submission being shared with the ACCC.

With respect to the technical framework, we:

- a) support the ACMA policy for new receiving earth stations (ESRX) to be authorised under area-wide receive licences (AWLRX) such that the AWLRX is of a size (and cost) commensurate to the spectrum denial caused to wireless broadband (WBB) services;
- b) support the more stringent RF filter mask assumed for ESRX authorised under new AWLRX, which effectively requires licensing of the front-end RF filter passband—as we've previously suggested to the ACMA in responses to former consultation processes;
- c) agree with the proposed new protection requirements for ESRX under AWLRX applicable to spectrum-licensed transmitters in the *Radiocommunications Advisory Guidelines (Managing Interference from Spectrum Licensed Transmitters – 3.4 GHz Band) 2015* (“the Tx RAG”);
- d) recommend that ESRX under AWLRX be required to be registered;
- e) recognise that the licensing and coordination requirements specific to AWLRX have so little in common with AWLs authorising transmitters—which the ACMA refers to as “AWL tx”—and optimised for supporting WBB, that it would be much better to create a separate RALI dealing with AWLRX, rather than over-complicating the already very complex RALI.

¹ Pivotal has different views on this matter, and will express its view in its individual submission.

Comments on the Technical Framework

Treatment of AWLRX in separate RALI

RALI MS 47 is a large and very complex document and, while the ACMA has gone to great efforts to comprehensively state all requirements to eliminate ambiguity, it is difficult to determine at a glance what is and is not covered by the RALI and what is and is not permitted or required to be authorised by an AWL, such is the size of the document and the number of services covered.

From a review of the draft changes to RALI MS 47, it is evident that the proposed AWLRX have little in common with the AWLs optimised for WBB, other than the basic “building blocks” of an AWL and some basic principles. AWLRX are different to AWL (tx) in that the following do not apply to them:

- the *Radiocommunications Licence Conditions (Area-Wide Licence) Determination 2020* (“the AWL LCD”);
- formal coordination requirements for registering the station (i.e. all of Section 4 of the RALI, except for s4.5, part of 4.8 and s4.10.2);
- no obligation to register the station (addressed further below);
- channel raster;
- assignment priority for AWL tx;
- Advisory Notes.

The changes scattered throughout the document—including clarifications about which rules apply to AWLRX only, AWL (tx) only and both AWL tx and AWLRX—will make RALI MS47 even more complicated than it already is, and unnecessarily so.

As such, we recommend that ESRX authorised under AWLRX should be dealt with in a separate RALI. We anticipate that the ACMA might not be in favour of repeating some of the (few) basic AWL concepts which both AWL tx and AWLRX *do* have in common. In (pre-emptive) response, we would argue that the ACMA is already repeating these in both RALIs MS46 and MS47, so we see no harm in repeating these again in a separate document for AWLRX. The new separate RALI could consist of a much smaller subset of sections:

- The basic principles of AWLs as per Section 1 of the draft RALI MS47—but only the parts which also apply to AWLRX
- Section 2.1 “frequency ranges and areas available for AWLs” (but only Table 1a)
- Section 3.1, 3.2, 3.3—but only the parts which also apply to AWLRX, noting that:
 - the coordination zones of sections 3.2.2, 3.2.3, 3.2.5 are very far from the spectrum space applicable to AWLRX, and there are no Embargoes in this spectrum space (other than Embargo 78 which is currently preventing over-the-counter applications to preserve the spectrum for 3.8 GHz AWLs)
 - in section 3.2.6, the Assignment Priority applicable to AWLRX is completely different to that applicable to AWL tx
 - the requirement to comply with the AWL LCD in section 3.3 is only applicable to AWL tx

- the Advisory Notes in section 3.3.1 are only applicable to AWL tx
- Section 4.5—Coordination with AWLRX receivers
- Section 4.6—Registration of AWLRX receivers (addressed further below)
- Section 4.8—Coexistence with incumbent point to multipoint services (but only the second and fourth paragraphs, the table can be replaced with a reference to Section 4.8 of RALI MS 47)
- Section 4.10.2—Coexistence with receiving earth stations authorised under an AWLRX
- Appendix A—Areas available for AWL licensing (but only the second table for AWLRX licensing).

The ACMA may also see some benefit in such a new separate RALI covering both AWLRX as well as under Earth Receive apparatus licences, in which case a couple of other sections—namely Section 4.10.1 and Appendix F—could also be moved to the new RALI.

Obligation to register the ESRX

Our understanding is that ESRX must be licensed. From Annex A of the ACMA’s Consultation Paper: Variation to the Low Interference Potential Device Class Licence, in Issues for Comment (IFC) 35/2022²:

Section 46 of the *Radiocommunications Act 1992* (the Act) provides that a person must not operate a radiocommunications device otherwise than as authorised by a spectrum, apparatus or class licence. Under section 7 of the Act, radiocommunications devices are radiocommunications transmitters (other than of a kind specified by the ACMA) and radiocommunications receivers of a kind specified by the ACMA. In the *Radiocommunications (Specified Radiocommunications Receivers and Types of Transmitter Licences and Receiver Licences) Determination 2014*, an earth-receive station is specified as a radiocommunications receiver and is therefore a radiocommunications device. For this reason, all earth station receivers are required to be licensed.

The ACMA’s *Business operating procedure—Submission and processing of applications for earth, earth receive apparatus licences and device registrations under area-wide apparatus licences for fixed earth stations* (“the BOP”), contain the ACMA policy and requirements around checking the status of the ITU filing for the satellite service with which an earth station is communicating. When dealing with AWLs in the 26/28 GHz band that authorise earth station transmitters (ESTX), the licensee can apply for an AWL—including one which *only* authorises operation of ESTX (i.e. “AWL – FSS only”)—without undertaking any such checks. Rather, the required checks are undertaken prior to registering the ESTX device under the AWL.

The draft revision of RALI MS 47 states that there is no requirement for the licensee to register the ESRX. This would give the licensee the option to choose not to register the ESRX. In this case, at what point is he or she required to satisfy ACMA policy as specified in the BOP?

In light of this, we recommend that the relevant RALI dealing with ESRX under AWLRX include a requirement for the ESRX to be registered.

² ACMA, October 2022, *New arrangements for low interference potential devices - consultation 35/2022*.

ESRX under AWLRX in the Tx RAG

We note the ACMA's proposed amendments to the *Radiocommunications Advisory Guidelines (Managing Interference from Spectrum Licensed Transmitters – 3.4 GHz Band) 2015* ("the Tx RAG") to introduce protection requirements for ESRX authorised by an AWLRX in the 3.8 GHz band, contained in the consultation paper itself. We also note the ACMA's clarification in the consultation paper that *"These proposed variations are in addition to those that were subject to consultation in the March 2023 Draft allocation and technical instruments for the 3.4/3.7 GHz bands auction."* We assume that these initial variations mentioned here have already been incorporated into the latest compilation of the Tx RAG dated 27 June 2023. Assuming this is the case, below in Table 1 is a comparison of the protection requirements for ESRX under Earth Receive apparatus licences and ESRX under AWLRX.

In summary, we are comfortable with the protection requirements proposed in Part 4.5 of the Tx RAG, since they are no worse than the protection requirements for Earth Receive apparatus licences which spectrum licensees were already subject to in Part 4.3.

That said, we do have a couple of suggestions. Firstly, we question the utility of the wording *"the subject of an area-wide receive licence"* in the proposed new Part 4.5 of the Tx RAG. In the draft review of RALI MS 47, section 1.4, Step 2, it is clearly stated that *"Only registered devices generally will be afforded any protection from other services detailed in this RALI, where applicable"*, and in section 4.6 that *"registration of fixed location receivers is encouraged as only registered devices will generally be afforded protection"*. As such, we propose that the words *"the subject of an area-wide receive licence"* be replaced with *"registered under an area-wide receive licence"*, which will perhaps also facilitate merging of points (a) and (b) of Part 4.5(1).

Secondly, comparison of wording around the receiver overload mechanism (see table below) reveals the addition of the words *"at frequencies outside of the frequencies authorised by area-wide receive licence"*. Noting that these words do not feature in the existing protection requirements, we propose that they be omitted, or at the very least made clearer by perhaps changing to *"at frequencies within the licensed bandwidth of the transmitter"*.

Earth Receive apparatus licences in 3600-4200 MHz	AWLRX in 3750-4000 MHz
... total power received from the interfering service at the input of an FSS Earth station receiver (i.e. after considering Antenna gain, radiofrequency (RF) filtering and other losses) does not exceed -65 dBm.	... total power received from the transmitter at the input of an earth station receiver (after considering antenna gain, radiofrequency filtering and other losses) does not exceed a total of -65 dBm at frequencies outside of the frequencies authorised by area-wide receive licence.

Table 1—comparison of protection requirements for ESRX authorised under different licence types

Requirement	Earth Receive apparatus licences in 3600-4200 MHz	AWLRX in 3750-4000 MHz
Co-channel coordination	4.3(1)(c)(ii) coordination cull radius: within 200 km 4.3(2) protection criterion: -128.6 dBm/MHz for 20% time	Only possible in 3750-3800 MHz in “Rural Australia” (and outside ESPZ) Note: in Remote areas and inside Earth Station Protection Zones (ESPZ), ESRX will continue to be authorised by Earth Receive apparatus licences. For ESRX in 3750-3800 MHz in “Rural Australia” (and outside ESPZ), in the draft RALI MS47, the AWLRX licensee is expected to be far enough away from a spectrum licence area boundary to ensure the protection of its ESRX
Co-channel coordination (incumbent ³ ESRX only)	4.4(3) coordination cull radius: within 300 km 4.3(3) protection criterion: -119.9 dBm/MHz for 0.005% time	N/A—incumbent ESRX will remain under Earth Receive apparatus licences until they vacate the spectrum space re-allocated for spectrum licensing
Adjacent-channel (unwanted emissions) coordination	4.3(1)(c)(i) coordination cull radius: within 100 km 4.3(3) protection criterion: -128.6 dBm/MHz [in the worst 1 MHz within the licensed bandwidth of the ESRX] 4.3(5): * propagation model: P.452 with $p = 20\%$ * radiation pattern in S.465 if actual pattern not available * notification requirement	ACMA considers N/A
Adjacent-channel (overload) coordination	4.3(1)(c)(i) coordination cull radius: within 100 km 4.3(4) protection criterion: -65 dBm RF filter attenuation as per “ACMA filter mask” in Table 1 4.3(4B)-(4D) application of “ACMA filter mask” only below ESRX lower frequency edge, or both below & above lower & upper frequency edges, depending on licence/coordination dates 4.3(5): * propagation model: P.452 with $p = 20\%$ * radiation pattern in S.465 if actual pattern not available * notification requirement	4.5(1)(c) coordination cull radius: within 100 km 4.5(2) protection criterion: -65 dBm RF filter mask attenuation as per “brick-wall filter mask” Application of “brick-wall filter mask” to both below & above lowest & highest frequencies specified in the AWLRX for the geographic area containing the ESRX in question. 4.5(3) * propagation model: P.452 with $p = 20\%$ * radiation pattern in S.465 if actual pattern not available * notification requirement

³ i.e. only those within the spectrum space re-allocated for spectrum licensing as part of the 3.6 GHz band auction (2018) or the 3.4/3.7 GHz band auction (2022)

Sections of the draft RALI specific to ESRX under AWLRX

We are generally supportive of the ACMA proposals for:

- a) new receiving ESRX to be authorised under AWLRX such that it is of a size (and cost) commensurate to the spectrum denial caused to wireless broadband (WBB) services in the band; and
- b) specification of a more stringent RF filter mask assumed for ESRX authorised under new AWLRX (specified in section 4.10.2), which effectively requires licensing of the front-end RF filter passband—as we’ve previously suggested to the ACMA in responses to former consultation processes.

In section 4.5 of the draft RALI MS 47, the ACMA clarifies that:

- a) 4.5.1: co-channel coexistence is managed by a combination of (i) the AWLRX licensee applying for a sufficiently large licence area to protect the ESRX from co-channel interference; and (ii) transmitters operated under co-channel/adjacent-area AWLs and spectrum licences complying with their own Device Boundary (DB) requirements.
- b) 4.5.2: adjacent-channel coexistence is managed by the overload threshold calculation prescribed in section 4.10.2.
 - a. We note that the coordination requirements in section 4.10.2 of the draft RALI MS 47 are roughly the same as those proposed to be included in Part 4.5 of the Tx RAG, but applied to AWL transmitters as opposed to spectrum-licensed transmitters.
- c) 4.5.3: in the case of coordination failure, the ESRX is afforded protection and the AWL transmitter is not to be registered (unless agreement can be reached with the affected AWLRX), even though the AWL transmitter failing coordination is not (and cannot be) within the AWLRX area, which *should* have been sufficiently large to protect the ESRX.

We do have some concern about the “failure of coordination” provision in section 4.5.3, since the AWLRX licensee has not (in the case described above) applied and paid for this area of spectrum denial to WBB services. That said, this area of spectrum denial is limited to that in which the transmitter could exceed the ESRX overload threshold of -65 dBm with a filter attenuation of 60 dB—in other words, a net overload threshold of -5 dBm. It seems reasonable for the ACMA to conclude that this area of potential overload would be sufficiently small to avoid forcing the AWLRX to include such smaller overload areas outside its RF filter passband edges.

Noting that the AWL (tx) licensee is, in accordance with s4.5.1, considered not to cause co-channel interference to an ESRX under AWLRX provided that it complies within its Device Boundary requirements, it is effectively exempt from the registration restrictions details in s4.5.3. As such, we would prefer that s4.5.3 be clarified to only apply to adjacent-channel coordination, i.e. that the words “*co-channel or*” be deleted.

In section 4.6 of the draft RALI MS 47, the last dot point says recommends AWLRX licensees to “*consider the advisory note detailed in section 3.3*”. Which Advisory Note is the ACMA referring to here?

Lastly, we note that—since the ESRX cannot cause interference—the AWLRX licence applicant applies for an AWLRX of an insufficiently small size at their own risk, and the ACMA grants them this flexibility. However, we believe it would be prudent for the ACMA to specify a recommended methodology for determining the required licence area.

Channel & spectrum limitations on ESRX

The draft amendments to RALI MS 47 state that the channel raster and minimum channel size requirements do not apply to AWLRX licences, so under the proposal an AWLRX could be issued on any frequency/bandwidth combination. One concern AMTA has with this approach is that it may lead to 10 MHz channels that are unusable for WBB. In such cases, it seems reasonable that the AWLRX licence should be configured to include the entire 10 MHz (consistent with the channel raster), commensurate with the spectrum denial it causes.

We also note that the ACMA proposes not to apply the Allocation Quantum Policy (AQP)—applicable to all AWL (tx)—to AWLRX licences intended to support receiving earth stations. AMTA is concerned that this is an inequitable approach which could potentially starve opportunity in populated areas, if the earth station licensee applies for a large bandwidth. It is therefore proposed that, *by default*, the AQP also apply to AWLRX. Where more spectrum is needed, the AWLRX applicant could apply to the ACMA for an out-of-policy exemption and provide justification as to the need for spectrum holdings exceeding the AQP limit.

Requirement to implement tighter RF filter mask

As stated above, we support the specification of a more stringent RF filter mask assumed for ESRX authorised under new AWLRX (specified in section 4.10.2 of RALI MS 47 and in Part 4.5 of the Tx RAG), which effectively requires licensing of the front-end RF filter passband—as we’ve previously suggested to the ACMA in responses to former consultation processes.

However, we note the much looser ACMA filter mask remains applicable to existing Earth Receive apparatus licences in Part 4.3 of the Tx RAG. The slow filter rolloff has the potential to cause spectrum denial to spectrum licensed transmitter deployment in perpetuity. We also know that there is an expectation for Earth Receive licensees to take action to appropriately filter their receiving earth stations by no later than 16 July 2027. As such, we propose that this filtering action be expanded to *also* include compliance with a further requirement to ensure filter attenuation of at least:

- 60 dB below 3800 MHz (or below 3750 MHz in “Rural Australia”); and
- 80 dB below 3720 MHz (or below 3670 MHz in “Rural Australia”)

These minimum attenuation figures are based on the more stringent frequency response in Table 2 of the consultation paper, which is in turn based on the FCC’s filter mask⁴.

⁴ FCC Rule 85 FR 22804, April 2020, Expanding Flexible Use of the 3.7 to 4.2 GHz Band, III. Report and Order, D. Technical Rules for the 3.7-4.2 GHz Band, 7. Protection of Incumbent FSS Earth Stations, available here:

Other technical matters / comments on RALI MS 47

Antenna pointing restrictions

Overall, AMTA is very disappointed with the ACMA’s decision to extend interim mitigation measures—intended to address coexistence with radio altimeters—to (a) include the band 3700-3800 MHz, in addition to 3800-3950 MHz; and (b) for a further year until 31 March 2026. We also disagree with the introduction of an ***ongoing*** EIRP limit applied to 3.7 GHz spectrum licences. More detail on this objection is outside the scope of this consultation.

For now, we focus on the precision of the antenna pointing restrictions applicable in 3700-3800 MHz in any area, and defined in clause 4.7.3.2 of RALI MS 47 (which will become 4.9.3.2 if the two proposed sections on AWLRX—4.5 and 4.6—are inserted). The current wording in the RALI is:

The transmitter must restrict any fixed mechanical or electrical tilt of a WBB antenna system to below the horizon.

Following an initial comment we made regarding the ambiguity of this text, the ACMA issued a correction on 3 July which reads:

Clause 4.7.3.2 should be interpreted as: ‘The transmitter of a WBB antenna system must restrict both fixed mechanical tilt and fixed electrical tilt components to the horizon or below. If one component is at the horizon, the other must be below the horizon.’

We still consider that the revised definition unnecessarily restricts individual components, when really the ACMA’s aim is to ensure that the net beam tilt is below the horizon. For this reason, we propose that the relevant clause should be replaced with:

The licensee must ensure that the net combination of fixed mechanical tilt and fixed electrical tilt component is oriented below the horizon.

Frequency offsets applicable to requirements

In section 3.2.1 on restrictions on what AWL areas can be applied for, and with respect to existing adjacent-channel point to multipoint (PMP) services, Accredited Persons (APs) were advised—in an email from the ACMA dated 18 July 2023—that the “10 MHz or less” will be corrected to “less than 10 MHz”, and we expect this to be reflected in the revision to the RALI following from this consultation process. We note that this would align with the minimum separation distances in section 4.8.1.

In a similar fashion, we consider that it doesn't make much sense to apply a particular protection criterion *up to and including* the guard band breakpoint value, it should only apply *up to* the guard band breakpoint. As such, in Tables 5 and 6 in section 4.8.1, the \leq sign should be replaced with a $<$ sign in the second and third rows of each table (i.e. to then say < 5 MHz, < 15 MHz; < 20 MHz and < 30 MHz). It would then follow that there needs to be a consequential replacement of " $< F_{\text{Offset}}$ " with " $\leq F_{\text{Offset}}$ " in the third row of each table, and the replacement of the $>$ sign with a \geq sign in the final row of each table.

Section 3.2.1 AWL issue policy

Under the proposed arrangements⁵, the ACMA state that they will not issue an AWL authorising the operation of a radiocommunications transmitter in the 15 MHz block immediately adjacent to a spectrum licence—referred to herein as "**restricted use bands**" (RUB).

AMTA's view is that this should be increased to 20 MHz to align with the channel raster described in Section 2.2 of the draft RALI MS-47. To reduce this guard band to 10 MHz would lead to potential adjacent channel interference should two services have unsynchronised or disparate frame patterns. AMTA's experience is that 20 MHz guard band should be sufficient to address this issue.

Additionally, we note this also is restricted by the text earlier⁶ in the same section which states that the upper and lower frequencies authorised by the AWL tx licence should align with the channel raster detailed in Section 2.2 of the RALI. If the ACMA retains the 15 MHz "guard band", Chevron 2 effectively means a licensee wishing to operate down to the 15 MHz boundary would need to obtain a 10 MHz wide licence but only use the top 5 MHz. For example, obtain a licence from 3810-3820 MHz in a metro area, but only use 3815-3820 MHz of that licence.

⁵ Draft RALI MS-47, section 3.2.1, seventh chevron, p.8.

⁶ Draft RALI MS-47, section 3.2.1, seventh chevron, p.8.

Additional flexibility for AWL licensing and deployment closer to spectrum licence boundaries via synchronisation

We thank the ACMA for taking our previous requests on board and adopting both (a) the more stringent Device Boundary Criteria (DBC) of section 4.2.2 of RALI MS 47 (“the s4.2.2 DBC”) and (b) the “restricted use bands” (RUB) defined in section 3.2.1 and Appendix A of the draft review to RALI MS 47. We believe that this provides a great deal of certainty and security in terms of how spectrum licensees can operate their vast networks without their operations being at the mercy of an AWL invoking the synchronisation requirement.

That said, we do consider that some additional flexibility can be introduced to allow AWL licensees to deploy closer to spectrum-licensed spectrum space *provided they are willing to modify their operations to synchronise with spectrum-licensed operations without impacting the latter*. Arguably this could encourage AWL licensees to adopt 3GPP-compliant equipment and lead to more efficient use of the spectrum overall, due to the reduction of dead zones, while still satisfying the critical aim of unduly impacting the efficiency of wide-area network operations.

To this effect, we note a proposal for a potential approach for adding such flexibility into RALI MS 47. This proposal was made by Pivotel and is detailed in their submission. Other AMTA members are open to supporting the general concept behind the proposal, provided that spectrum-licensed operation is sufficiently protected and unconstrained by those AWL transmitters that would benefit from this proposal, thereby conserving the full utility and intent of both the more stringent DBC and the RUB.

Before making a decision on or implementing such a proposal, we would urge the ACMA to discuss further with AMTA, and we would be disappointed with a situation whereby the next insight into the ACMA’s thinking on this matter is in the publication of the next iteration of RALI MS 47.

Adjacent-band/same-area case: As per section 3.2.1 and Appendix A of the draft RALI MS 47, and as noted in the ACMA’s consultation paper, *“the ACMA will not generally issue an AWL authorising the operation of radiocommunications transmitters in the 15 MHz of spectrum directly adjacent to a spectrum licence”, “unless an applicant can demonstrate satisfactory coordination measures”*. It could be explicitly stated that such “satisfactory coordination measures” include either (a) agreement with the adjacent-band licensee, or (b) commitment to comply with the requirements for additional flexibility via synchronisation.

Matters outside the technical framework

AMTA supports:

- a) the proposed restriction of initial Area Wide Licence (AWL) licensing periods to expire no later than 13 December 2030 (the expiry of 3.4 GHz spectrum licences);
- b) the ACMA's proposed approach to renewals, i.e. not including a renewal statement, provided that the proposed Advisory Note is included—i.e. the one stating that when deciding whether to renew a licence, that the ACMA may have regard to whether the spectrum has been used and whether there is unmet demand for spectrum in the 3.4–4.0 GHz band;
- c) Option 2 for the allocation approach⁷; and
- d) the allocation principles outlined in pages 24-25 of the consultation paper.

With respect to the Allocation Quantum Policy (AQP) limits, AMTA members will express their preferences in their own individual submissions.

⁷ Pivotal has different views on this matter, and will express its view in its individual submission.

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