30/09/2021

AMTA

Australian Mobile Telecommunications Association

AMTA Submission

Australian Communications & Media Authority

IFC 31/2021—Planning for wireless broadband use in urban areas in the 3400–3475 MHz band—Options 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.

AMTA Views on the ACMA's Options for use of urban excise spectrum space

AMTA presents the following high-level principles that we have considered in order to develop our views on which Options are preferred and which are unsuitable.

1. **Maximise the population to help maximise utility**: Mid-bad spectrum is scarce, and hence valuable, even with tight technical constraints limiting deployment. Due to its scarcity, it is vital the technical configuration is optimised to serve the greatest population with the greatest potential benefit, rather than optimised to serve bespoke, localised solutions, e.g. for covering individual premises like campuses or industrial facilities, or for WISPs covering a single suburb or district within a larger city.

    a. In this sense, we agree with the ACMA's statement that, with respect to implementing Option 2 in the restricted cell portion 3460-3470 MHz under Option 4: *"It supports a greater density of deployments and spectrum utility in the 3460–3475 MHz frequency range. It would also allow an operator to combine this spectrum with spectrum below 3460 MHz to deploy services with a larger contiguous bandwidth"*.

2. **Encourage homogeneity**: Mixing use cases (e.g., fixed wireless, mobiles, localised deployment) within a sub-band leads to under-utilisation of spectrum because greater interference protection—via mechanisms like guard bands & (indirectly) dead zones, power limits, antenna pointing restrictions, synchronisation requirements, etc., is required between heterogeneous operators. More stringent interference protection measures prevent the spectrum reaching its highest value use. Hence, homogeneity should be sought where possible, i.e., allocating all the 5G mobile networks together in the same spectrum space, all the localised deployments together, etc.

3. **Plan ahead across the entire 3400-4000 MHz band**: Planning guidelines should be created to show where the ACMA believes different use cases should reside. Technical parameters can then be optimised based on these groupings.

    a. While we understand that the ACMA wants to strictly discuss technical matters only in the TLGs, without discussing how allocation will be carried out in detail, unfortunately the allocation process can affect how technical matters could or should be taken into account.

4. **Avoid AWLs for LA WBB in high demand areas**: Most AMTA members are concerned about the use of AWLs for LA WBB in high demand areas, e.g. for covering individual

premises like campuses or industrial facilities, or for WISPs covering a single suburb or district within a larger city. These arguments have previously been presented to the ACMA via the 3400-4000 MHz TLG and are reproduced below under the section titled *"AMTA concerns over AWLs for LA WBB"*.

5. **Allow flexibility for technology to evolve**: We consider technology will evolve to better compensate for interference. We also assume that NBN's FWA will be upgraded to 5G with AAS at some point in the next 5-10 years. As such, we need a technical arrangement that can accommodate future **macro base station deployment** (even if it is not technically possible today) without having to revisit licence conditions, s.145 determinations, RALIs and RAGs.

6. **Promote certainty to encourage investment**: Most AMTA members prefer spectrum licensing to AWL as the licensing mechanism for the Urban Excise, again because of the scarcity of the spectrum and the likelihood of longer duration licensing, bringing certainty to investment and enabling the spectrum to achieve highest value use.

    a. Furthermore, if there needs to be another restack exercise in the future to consolidate the spectrum holdings of users across 3400-3800 MHz, spectrum licences will facilitate secondary trading; AWLs would not.

7. **Facilitate use of the RU band where possible**: The technical definition for the Restricted Use (RU) Band needs to be sufficiently flexible such that if MNOs end up on both sides of the RU band, and can coordinate as they do today at frequency boundaries between 3475-3700 MHz, then operation in the RU band is carried out seamlessly as part of the usable Urban Excise spectrum. **However, if another use case is in the Urban Excise immediately below the RU band, then then RU band acts as a guard band**.

    a. In this sense, we agree with the ACMA's definition of the RU band in both footnote 3 and under Desirable Outcome 3, which reads *"In context of this paper, a restricted use band refers to a defined frequency range were either no operation is permitted, or operation is only permitted under certain conditions (e.g., agreement between operators)"*. This is further extended to clarify that synchronisation is a second condition under which operation could occur, in addition to agreement, i.e. *"Operation within these restricted use bands could be permitted via negotiation with the adjacent band spectrum licensee or if operation can be synchronised with the adjacent band licensee"*.

Based on the above principles, we arrive at the following views:

1. Option 3 is the worst of all possible options, as it does not permit macro base station deployment and it presents the greatest risk of geographically-localised operators occupying pockets of the urban excise spectrum resulting in inefficient use. We are strongly opposed to Option 3 being implemented, either as a standalone option, or as a sub-option within the restricted cell portion 3460-3470 MHz under Option 4.

2. Option 2 is only better than Option 3 in that the geography is not subdivisible. However, it still denies macro base station deployment, and is therefore not suitable.

3. That leaves us with **Option 1 and Option 4**.
    a. Our preferred Option is Option 4 ***but only if*** Option 2 is adopted within the restricted cell portion in 3460-3470 MHz, as per the ***"ACMA preliminary preferred option"***.
    b. We would ***oppose*** an Option 4 with Option 3 adopted within the restricted cell portion 3460-3470 MHz. We would consider Option 1 to be preferable over such a scenario.

AMTA acknowledges that there is a "no change" option that allows the ACMA and other potential licensees to wait for technology and interference management techniques to advance to a point where the aims of the ACMA are more easily achievable. AMTA would not oppose this outcome.

AMTA concerns over AWLs for LA WBB

Excerpt from AMTA's response to the 3400-4000 MHz TLG Paper v1:

> *An AWL with a small licence area whose boundaries are within heavily populated areas also creates 'dead-zones' within those heavily populated areas. Dead-zones are spectrum space which needs to remain vacant to manage interference between the systems on either side, which means that there is very valuable spectrum unable to be used in highly populated areas. Small-area AWLs also have the potential to deny a wider-area network based on macro-cell deployment, be it that of a mobile network operator (MNO) or a provider of fixed wireless access (FWA) like a wireless internet service provider (WISP). It's likely that a small-area LA WBB would preclude a macro-cell deployment elsewhere within the same city.*
>
> *As such, we believe that the geographic areas for urban excise licences should be pre-defined and covering the entire city, regardless of the intended coverage of the system. In order to support different use cases, it is not necessary for the applicant to apply for wide channels, and applicants would have the option to apply for narrower channels.*

Release of 3.4 GHz Urban Excise spectrum

We agree with the ACMA's statement regarding Options 1, 2 (and therefore also Option 4) that *"it is desirable to combine the release of spectrum with allocation processes for spectrum in the 3700–4200 MHz band"*. If area-wide licensing is employed, either as the sole mechanism or in combination with spectrum licensing, the AWL release should occur shortly after the auction of metro area spectrum within the range 3700-4200 MHz, currently scheduled for 2023.

Furthermore, we believe that in order to minimise the number of potential adjacent-frequency boundary issues in the Urban Excise spectrum space, we recommend that the RU band *not* be made available in isolation. Rather, it should be bundled with the lower-adjacent RC band as a single product. Note that this comment is made with respect to a future scenario involving Urban Excise spectrum space that is spectrum-licensed and arranged as per Option 4 (with an Option 2 RC band).

If the ACMA decides that Urban Excise spectrum space will be made available via an apparatus licensing arrangement (i.e. AWLs), then we believe that the release of spectrum for AWLs in Urban Excise areas in 3400-3475 MHz should wait until after AWLs have already been allocated in metro areas in 3800-4000 MHz. This will help to determine, *inter alia*, whether there is indeed sufficient demand to allocate Urban Excise areas in 3400-3475 MHz for AWL.

AMTA View Interference management approaches

We agree that in TDD networks, interference between high-sited base stations (BS-BS) is the dominant interference mechanism. However, we also agree that within the guard interval, this BS-to-BS interference mechanism can be addressed via synchronisation. When BS-BS interference is addressed via synchronisation however, it does open the door to other interference mechanisms, namely those listed by the ACMA. We agree with the ACMA's approach to develop a coordination requirement which would ensure protection of user equipment receivers from cross-border base station transmitters (i.e. BS-CPE and BS-MS). We also agree that no specific coordination requirements are required for interference between user equipment.

Below we provide our views on the interference management approaches developed in the 3.4 GHz Urban Excise TLG and presented in the ACMA's Options Paper:

Item	Preferred AMTA Option / Comment
Unwanted emission limits	AMTA agrees with the ACMA's suggestion to adopt the same unwanted emission limits as defined for existing 3.4 GHz spectrum licences.
Secondary synchronisation requirement	AMTA supports **Option B**, which is the retention of the existing synchronisation requirement, as detailed in clause 11 of Licence Schedule 4 on all 3.4 GHz spectrum licences, as a baseline synchronisation requirement to address co-channel BS-BS interference. AMTA does not support the introduction of a secondary fallback synchronisation scheme (as proposed in Option A). The introduction of a secondary synchronisation requirement is an inefficient and blunt instrument to solve a relatively rare "edge case" interference scenario. It would be difficult to identify where the interference came from and therefore which transmitters would have to fall back to the secondary frame structure without affecting the entire network (or a very large area thereof). Therefore, in practice, it may cause a significant reduction in capacity for the entire urban excise network in a particular city. Moreover, ducting events are transient in nature (several hours to possibly several days) and some time will be needed to communicate with affected Urban Excise operators, who would then have to plan and apply the change. By the time this is completed the ducting effect is likely to have changed or dissipated. Lastly, even with such a hit to capacity, the secondary synch fallback would not guarantee the elimination of interference due to ducting, as interference could still occur beyond the ~190 km guard interval distance.
Application of the current 3.4 GHz device boundary criteria (DBC)	AMTA supports the ACMA's proposal to exempt transmitters from the DBC for cases where the device boundary crosses the urban excise area boundary, provided that there is benefit derived from adopting a suitable BS-CPE/MS calculation methodology as an alternative to the DBC. In this sense, we believe a re-evaluation of the existing DBC—against the type/extent of networks that the ACMA believe could pass the alternative BS-CPE/MS calculation—is warranted. See further discussion on this issue below under *"BS-CPE/MS protection requirement"*.
Registering new devices inside urban excise areas within the 3400-3475 MHz band	AMTA supports an approach to ensure BS being registered protect NBN Co CPE receivers in the adjacent area. We have not yet come to a landing on whether pfd or C/(N+I) is preferred; or the values to be adopted. However, we have concluded that any pfd calculation involving worst-case CPE pointing should be single-entry, not aggregate. Further explanation is provided below under *"BS-CPE/MS protection requirement"*.
Registering new devices outside urban excise areas	AMTA supports an approach to ensure NBN Co BS being registered protect user equipment receivers in the urban excise areas. We have not yet come to a landing on

within the 3400-3475 MHz band	whether pfd or C/(N+I) is preferred; or the values to be adopted. Further comments below under *"BS-CPE/MS protection requirement"*.
Unregistered devices **outside** urban excise areas within the 3400–3475 MHz band	Our understanding is that NBN Co prefers **Option B**—that fixed UEs are deemed not to cause interference—such that their existing CPE installations would not have to cease operation in any case of interference. We note that the 'interference' mechanism being referred to here is from NBN Co Fixed CPE transmitters into Urban Excise BS receivers. We note that the Urban Excise BS transmitters will have to satisfy the BS-CPE calculation (i.e. PFD or C/(N+I) discussed above) with a view to protect NBN Co Fixed CPE receivers. We believe that there would be significant reciprocity, and therefore the cases for which a BS would pass the BS-CPE calculation and yet receive interference from a Fixed CPE would be limited. We wish to state that we do not agree to this "deemed not to cause interference" provision being proliferated in any spectrum space other than 3400-3475 MHz in urban excise areas.
Unregistered devices **inside** urban excise areas within the 3400–3475 MHz band	Whichever Option is adopted for the unregistered devices outside urban excise areas above, the exact same approach should be adopted for the unregistered devices inside urban excise areas. In other words, if Option B is adopted for outside urban excise areas, **Option B** should also be adopted inside urban excise areas.
Devices (both registered and unregistered) in the 3475–3700 MHz band	AMTA strongly agrees with *"No change to existing requirements"*. Spectrum licensees above 3475 MHz should not be affected by the introduction of operation within the adjacent-band urban excise spectrum space.
Measures to enable NBN Co to deploy new more spectrally efficient technologies in the future (e.g., 5G, AAS)	AMTA supports **Option B** over Option A. A blanket "no protection" approach as per Option A is not suitable.
Managing interference between 4G and 5G systems	AMTA supports **Option B**: to implement restricted use (RU) bands. We strongly agree with the ACMA that the synchronisation requirement should not be mandated between spectrum licensees above 3475 MHz and urban excise licensees below 3475 MHz. We strongly agree that an RU band is a better approach, and we have actually suggested an approach very similar to RU bands in the 3400-4000 MHz TLG.

In addition to the list of items from Table 10 in the consultation (the table above), for Option 4, there is a final requirement on in-band PSD limit. Below is the ACMA's proposal (characterised as "for example") and our response.

PSD limit of 17 dBm EIRP / MHz for devices in the RB	Within the 3460–3470 MHz frequency range, the power spectral density of a transmitter must not exceed a defined power spectral density limit; for example, 17 dBm EIRP per MHz.	Agree. We support a limit of 17 dBm EIRP per MHz for transmitters operating in the Restricted Block (RB) in Urban Excise geographies.

BS-CPE/MS protection requirement

Calculation methodology

This section relates to the "BS to customer premise equipment (BS-CPE)" interference mechanism listed at the beginning of Appendix E of the Options Paper. What isn't so clear from the Options Paper itself—but which was presented very clearly throughout the Technical Liaison Group (TLG) on the 3.4 GHz Urban Excise—is that:

- The ACMA considered that application of the existing device boundary criterion (DBC) in the 3.4 GHz s145 Determination may prevent registration of devices inside urban excise areas.

- The ACMA believes that BS-BS interference mechanism will largely be addressed via synchronisation between an urban excise network and a co-channel NBN Co network in the NBN service areas, which are mostly within 64 km of the urban excise geographic licence boundary.

- In the absence of BS-BS interference between synchronized co-channel urban excise and NBN Co networks, the dominant interference mechanism becomes BS-to-UE (user equipment):

    - In the case of interference *from* urban excise areas, the NBN Co UEs are CPEs; and

    - In the case of interference *into* urban excise areas, the urban excise UEs are mobile stations (MS).

The last two points are touched on in page 12 of Appendix B of the Options Paper. Therefore, it must be understood that in effect, this BS-to-CPE/MS protection requirement is replacing the DBC as the primary co-channel interference management tool (in combination with synchronization).

The ACMA has proposed two protection criteria to use in the BS-to-CPE/MS calculation.

- The first is a power flux density (PFD) limit, which is an absolute protection criterion applicable to all modelled CPE/MS. As such, this protection criterion needs to be such that it would protect a CPE/MS operating close to the minimum wanted signal level threshold, and is by its very nature, a relatively *conservative* approach.

- The second is a carrier-to-interference plus noise ratio (C/(I+N)), which is a relative protection criterion such that the tolerable unwanted signal level is proportional to the calculated wanted signal level received by the CPE/MS. As such, this protection criterion allows for higher unwanted signal levels that won't necessarily result in harmful interference for CPE/MS that are receiving strong wanted signal levels. Therefore, it is a more *optimistic* approach, but also more realistic.

Despite being more realistic approach, it increases the calculation complexity due to the fact that additional steps are required. The steps involved in a C/(I+N) calculation include:

1. Distribution (pre-defined, uniform or randomised) of CPE/MS
2. Selection of host BS for each CPE/MS
3. Calculation of the pointing angle of the CPE/MS
    a. and gain in the direction of the host BS if AAS UE
4. Calculation of wanted signal level for each CPE/MS from host BS
5. Calculation of CPE/MS antenna discrimination in the direction of the interfering BS
6. Calculation of the unwanted signal level for each CPE/MS from the interfering BS

In theory, the PFD calculation could be carried out with just Steps 1 and 6, provided that some assumption was made about the antenna gain in the direction of the interference path. For omnidirectional MS, assuming in the order of unity gain in the direction of the interfering NBN Co BS might be a reasonable assumption. However, if high-gain directional antennas need to be considered for CPE receivers, the simplification of assuming that the directional antenna points directly to the interfering BS, is exceedingly conservative. It would be *even more* unrealistic for a calculation of aggregate interference, since this would assume that CPE is simultaneously pointing in the direction of every single BS transmitter in the urban excise network, which is impossible.

> ***Note:*** The ACMA indeed appears to be considering this worst-case antenna pointing scenario, given that it is using the pfd limit value of -99.9 dBm/(m^2.MHz) for Non-AAS transmitters, which is in turn derived from 6.3096e-15 W/MHz (interference threshold of -112 dBm/MHz) divided by the receiver's effective antenna aperture A_{eff}. In turn, the value of A_{eff} used was calculated as $G \cdot c^2/(4\pi f^2)$ = 0.06195, with G = 100 (20 dBi), c = 300 Mm/s, f = 3400 MHz.

Therefore, a PFD calculation would probably only be of any use if the additional accuracy provided by Steps 2, 3 and 5 were also added. It follows that, if all of the Steps except Step 4 need to be carried out to make the PFD calculation useful, there is no considerable saving on computational complexity achieved through use of PFD rather than C/(I+N).

Throughout the document, it also appears that the ACMA has an apparent preference for any calculation into CPE/MS to be on the basis of aggregate interference; i.e. when calculating the interference from a new BS to be registered, this must be power-summed to the interference from all the other BS in the network. As such, Steps 5 and 6 above need to be looped through for each BS in the network, with an additional Step 7 in which the unwanted signal level from each BS is power-summed to obtain an *aggregate* unwanted signal level.

Similar to the comment above regarding assumptions about CPE antenna pointing, the same applies to BS antenna pointing—and in the case of aggregate interference, network loading—especially for BS employing AAS. An aggregate interference calculation considering AAS BS in an urban excise network, with dynamically-steered beams all pointing towards a victim CPE, and all transmitting at the same time (i.e. not taking network loading into account), would also be exceedingly conservative and unrealistic. This could only be addressed by either (a) carrying out full probabilistic studies between adjacent-area networks, involving a large number of temporal 'timesteps', every time a device registration (or batch of device registrations) needs to be made; or (b) employing factors to account for the dynamic nature of 5G networks, e.g. 8 dB to account for AAS dynamic beamforming and 3 dB to account for 50% BS loading.

We've gone over a few different scenarios, and if we consider the number of times a single unwanted signal calculation needs to be carried out, we have:

- Single-entry: L calculations
- Aggregate: $L \times N$ calculations
- Probabilistic study: $L \times N \times M$ calculations

where L = # 'victim' CPE/MS locations, N = # interfering BS locations, M = # snapshots. We should assume that N and M would be in the order of 10^2 to 10^3.

> ***Note:*** In the ACMA's study in Appendix D to the Public Options Paper, it appears that each CPE location corresponds to a new timestep, such that some form of probabilistic study is carried out with just $L \times N$ calculations (L = 10,000).

We see from the above that if the additional Steps to calculate C/(I+N) add a margin of complexity X, and X is only in the order of 10^0 to 10^1, then the complexity of the calculation is actually impacted much more by moving to aggregate or probabilistic studies than it is by choosing C/(I+N) over PFD.

> ***Note:*** X would only be a large number if, in Step 2, one needed to consider a large number of potential host BS before selecting *the* host BS for a particular CPE/MS. In this sense, swapping Steps 1 and 2 such that CPE/MS are distributed for (and automatically allocated as served by) a particular BS, ensures that X remains a small number.

What is clear is that we absolutely need to avoid piling up multiple conservative or worst-case assumptions one on top of the other. In fact, we should avoid *unrealistic* scenarios altogether. The reverse is also true; we should avoid accumulating too many optimistic assumptions. Furthermore, at this stage, it would also seem overly onerous to have to carry out full probabilistic studies for each device registration (or batch of device registrations). The remaining combinations should be a mix of optimistic and conservative assumptions to provide an appropriate balance. What falls out of this is that the two viable options are:

A. **Single-entry PFD calculation** with worst-case CPE/MS gain in the direction of the BS being registered, resulting in *L* calculations; or

B. **Aggregate C/(I+N) calculation**, resulting in $L \times N$ calculations ($\times X$ complexity factor).

Note that we have excluded Single-entry C/(I+N) because this would involve the combination of two optimistic assumptions. We have excluded Aggregate PFD calculations noting that there is no considerable saving in complexity for an aggregate PFD calculation which takes the appropriate CPE discrimination into account.

Percentage of locations

For either of the PFD or C/(I+N) approaches, the protection criterion needs to be satisfied for a minimum percentage of the CPE/MS locations modelled, showing as "(TBD)%" in Appendix E. The NBN Co service areas, provided in the 3.4 GHz Urban Excise TLG, show significant areas within which the presence of CPEs would be unlikely (e.g. in elevated forested areas), and therefore there is no reason why failing the protection criterion in these areas should prevent the registration of a device in the adjacent urban excise area.

The ACMA also mentions—in Appendix D of the Options Paper—that in areas of significant population, it is likely that customers are served by fibre/fixed-line connections as opposed to via wireless, and so conceivably coordination failures in these areas would also be acceptable.

There are two methods by which such "permitted failure" areas are dealt with: (a) to maintain a relatively high value of *p* (i.e. 1 – 'TBD') such that *p* is large enough covers the "permitted failure" areas, e.g. in the order of 10-20%; or (b) remove them from the NBN Co service areas by significantly refining the NBN Co service areas. Noting that a large value of *p* could lead to interference over areas in which NBN CPEs are actually located, it may be more accurate to refine the NBN Co services areas as per (b). To do this, we would recommend NBN Co produce service area shapes based on actual customer premises, with a randomized offset location + buffer distance to address privacy concerns.

Comparison of BS-CPE/MS with original DBC

In the previous sections, we have identified a number of challenges and complexity associated with the proposed BS-CPE/MS calculations. We believe it is pertinent to circle back and assess whether the high-complexity proposals being assessed provide any considerable benefit, noting that the first step in the development of these proposals was that urban excise transmitters would have difficulties registering if they had to satisfy the DBC. In fact, it is entirely conceivable that the replacement, more complex, BS-CPE calculation could be more restrictive than the DBC.

Draft s145 Determination

We note that the draft *"Radiocommunications (Unacceptable Levels of Interference – 3.4 GHz Band) Amendment Determination 2021 (No. 1)"* in Appendix B proposes the replacement of section 9(2) of the current s145 Determination. However, there doesn't seem to be a clear purpose for this replacement, noting that the current 9(2) and the proposed replacement 9(2) address completely different situations.

The current section 9(2) of the s145 Determination is intended to exempt—from being deemed to cause unacceptable interference—a device boundary radial which ends up outside the Australian Spectrum Map Grid (ASMG).

The proposed replacement section 9(2) is intended to exempt a device boundary radial which crosses urban excise spectrum space. While we certainly agree with the inclusion of this exemption, we believe it should simply be added in a new subsection (e.g. 9(5)), and leave 9(2) in its current state.

Responses to Questions

Question 1: Comment is sought on the draft amendments to the s.145(4) Determination contained at Appendix B, found as a separate attachment in the key documents section of this consultation.

- ***Should additional measures be included to grandfather device registrations when minor modifications are made?***
- ***If so, what minor modifications should be permitted? For example, changes that results in the same or lower horizontal radiated power for the purposes of device boundary calculations. Alternatively, changes that result in the same or smaller device boundary as originally calculated when registering a device.***

We don't oppose this concept to allow NBN Co's network to develop and evolve. However, we need to consider further which minor modifications would be permitted under this provision.

Question 2: Comment is sought on the proposed changes to receiver spurious emission limits on 3.4 GHz spectrum licences.

AMTA supports the proposed changes to receive spurious emission limits on 3.4 GHz spectrum licences.

Question 3: Comment is sought on the draft amendments to RALI MS44 contained in Appendix C, found as a separate attachment in the key documents section of this consultation.

AMTA agrees with the proposed changes to RALI MS 44.

Question 4: Comment is sought on the options developed for use of spectrum in urban excise areas.

See opening section titled *"AMTA Views on the ACMA's Options for use of urban excise spectrum space"* above.

Question 5: Comment is sought on the desirable planning outcomes for use of spectrum in urban excise areas.

See opening section titled *"AMTA Views on the ACMA's Options for use of urban excise spectrum space"* above.

Question 6: Views are sought on the possible interference management approaches for both co-channel mechanisms (including ducting) and adjacent channel mechanisms (including adjacent band coexistence) contained at Appendix E.

See above section titled *"AMTA Views Interference management approaches"*.

Question 7: Comment is sought on the ACMA's preliminary preferred option. Are other options proposed, and if so, why?

See opening section titled *"AMTA Views on the ACMA's Options for use of urban excise spectrum space"* above.

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