



**AMTA Submission on the ACMA's Consultation Paper:**

**The 900 MHz band – Exploring new opportunities**

Initial consultation on future arrangements for the 900 MHz band, May 2011

**5 July 2011**

## Introduction

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 Carriage Service Providers (CSPs), handset manufacturers, network equipment suppliers, retail outlets and other suppliers to the industry. For more details about AMTA, see <http://www.amta.org.au>.

## Overview

AMTA welcomes the opportunity to participate in the ACMA's consultations on the 900 MHz band. The review of the 900 MHz band is timely and considering the potential benefits to Australian consumers, it is imperative that we examine the current use of the band and consider options for how the band could be more efficiently planned to make spectrum available for other services, such as mobile broadband.

With IDATE predicting that there will be 371 million LTE users worldwide by 2015, and that Asia and the US regions will be the primary markets driving this growth, AMTA appreciates that the ACMA recognises the ever increasing global demand for mobile broadband.<sup>1</sup> Such demand means mobile operators in Australia must have visibility and certainty of spectrum planning so that planning for investments in infrastructure including technology choice and capital requirements can be made in time to meet consumer and business needs.

An AMTA-commissioned research report undertaken in mid-2010 by [Network Strategies](#) examined the links between mobile broadband, productivity and the impact of new spectrum becoming available in the 700 MHz and 2.5 GHz bands.

Network Strategies estimated that the gross productivity benefits from mobile broadband in Australia over the period 2013 to 2020 to be around \$143 billion – provided that sufficient spectrum in appropriate bands is available. Network Strategies further estimates that by 2020 there will be almost 20 million mobile broadband subscriptions on handsets together with another 6.3 million data-cards (under a moderate growth scenario). In addition, Australian mobile traffic would reach 1360 million Gigabytes by 2014.

Since that research was undertaken, AMTA is aware of forecasts by Cisco that predict global internet data traffic will increase by a factor of 26 from 2010 to 2015, resulting in mobile data traffic of 75 Exabytes annually. Further, Cisco forecasts that by 2015 we will have twice as many network-connected devices as people globally; with over 15 billion active devices including mobiles, tablets, connected appliances and smart machines.<sup>2</sup>

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<sup>1</sup> IDATE May 2011, LTE World Summit, World LTE Market

<sup>2</sup> GSMA Mobile Business Briefing, 3 June 2011

These analyses demonstrate strong expectations for growth in demand for mobile broadband services and the potential economic, social and environmental opportunities that these services present for Australia. Replanning the 900 MHz band is an important part of the overall process of identifying opportunities for allocating further spectrum within the band and giving consideration as to how we can meet the wider demand for spectrum for mobile broadband.

AMTA has provided responses to selected questions raised in the ACMA paper below.

## **Responses to Issues for Comment**

### **1. The ACMA seeks comment on the proposed objectives of the review.**

While AMTA agrees with the objectives stated in the paper, AMTA believes that the proposed objectives could and should be broadened and more closely aligned with the ACMA's spectrum management principles.

AMTA therefore recommends the objectives of equity and investment certainty also be factored into the ACMA's assessment on future arrangements for the 900 MHz band.

AMTA also recommends that international harmonisation should be included as an objective. Although international harmonisation is not one of the ACMA's spectrum management principles, AMTA notes that the ACMA sees the international environment as a "key factor in considering the arrangements in the 900 MHz band"<sup>3</sup> and suggests that international harmonisation should therefore be included as one of the objectives of this review.

### **2. The ACMA seeks comment on the merits of replacing the current frequency band with an administrative band.**

AMTA supports replacing the current frequency band with an administrative band plan as this would allow for more flexibility and therefore efficiency. AMTA notes that under an administrative plan, suitable licensing arrangements will still be required in order to provide certainty to users of the band.

### **3. The ACMA seeks comment on the overall structure of the 900 MHz band and the current balance between different services in the band.**

AMTA strongly supports the retention of the current PMTS allocation in the 900 MHz band and considers that the current allocation should be retained in full and quarantined from any future spectrum sharing proposal.

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<sup>3</sup> Page 4, ACMA, The 900 MHz band – exploring new opportunities

AMTA advocates that the review process also focus on finding opportunities to expand usage by mobile broadband services. There is also some scope for looking into opportunities for low interference potential devices (LIPD).

With the progression of technology it is clear that LMR and point-to-point services will become increasingly lower value uses of spectrum as time passes. Indeed, it is likely that many of these services will migrate to IP based and mobile broadband networks in the future and so they would not necessarily be competing against mobile broadband services for spectrum.

AMTA suggests that the ACMA consider making generic allocations rather than service or technology specific allocations. For example, specify a band as being for broadband networks, without specifying a particular service or technology. This would allow for greater flexibility and efficiency of use.

#### **4. The ACMA seeks stakeholder comment on any other technologies or regulatory measures that should be considered as part of the 900MHz review.**

AMTA is supportive of the ACMA giving consideration as to whether the proposed 5 MHz lot sizes in a reallocated PMTS allocation in the 900 MHz band will achieve the objective of providing future flexibility.

While there is a strong case today for spectrum allocations in 5 MHz blocks (paired or unpaired) given the developments in 3G and LTE technologies, AMTA considers it is premature of the ACMA to predict that this will remain the optimum block size in the longer term.

Whatever block size is decided, it is important that the licensing arrangements are technology neutral and provide flexibility for the variation and trading of different block sizes over time.

#### **5. The ACMA seeks comment on what, if any, regulatory measures should be put in place to facilitate cognitive radio systems in the 900MHz band.**

In the absence of further evidence, AMTA doubts that cognitive radio, whitespace, Ultra-Wide Band (UWB) or any other spectrum sharing technologies will be able to operate effectively in the 900 MHz PMTS band. The 900 MHz band PMTS allocations are heavily and efficiently used, and it is unlikely any spectrum sharing technology, as it is currently understood, would work well under these conditions.

AMTA believes it is still too early to make any commitment to facilitate cognitive radio systems in the 900 MHz band. Currently it appears that there would be insufficient “white space” in the mobile broadband allocations to make this spectrum useful for cognitive radio systems.

**6. The ACMA seeks comment on the option of extending consideration for allocations down to 803 MHz rather than the current regional intention to maintain a guard band.**

AMTA disagrees with this suggestion and maintains that it would be more sensible to keep the lower boundary at 806MHz as this is consistent with APT planning and studies which require that 803-806MHz be maintained as a guard band for the 700 MHz digital dividend band.

This would be in line with our suggested objective (see response to question 1) of international and regional harmonisation.

**7. If allocations are extended to 803 MHz, what are the allocation options and associated coordination requirements for potential services using the digital dividend and adjacent segments?**

AMTA sees some potential for use of low interference potential devices (LIPDs) here. However, any such LIPD services would need to be very low powered and operate on an unprotected basis, under a class licence.

**8. The ACMA seeks comment on the option to expand the 900 MHz by 15MHz to include 805-820 MHz. What are the costs and benefits of moving to such an arrangement?**

AMTA supports an expansion of the 900 MHz band by 14 MHz, rather than 15 MHz, to include 806-820 MHz. Correspondingly, AMTA proposes that the 700 MHz band be defined as having an upper boundary of 806 MHz.

**9. The ACMA seeks comment on the possibility of enabling up to 2 x 15 MHz for new FDD services in 805-820 MHz paired with 850-865 MHz segment. How much of these segments should be replanned to facilitate FDD services?**

AMTA does not support this plan as the suggested segments are not aligned with any current international plans.

AMTA suggests that the ACMA monitor the international planning work currently being undertaken in this area:

- 3GPP transition plan for iDEN LTE services in 806-824/851-869 MHz segments.
- 3GPP proposal for expansion of Band 5 to cover 814-849/859-894 MHz segments
- ITU Resolution 646 which identifies spectrum within 806-824/851-869 MHz segments for advanced PPDR in the Asia-Pacific region.
- APT work on considering options for advanced PPDR in 806-824/851-869 MHz segments. (see also our response to question 19 below)

**10. Information is sought on the issues that such a replan would raise. What are the costs and benefits? How much time would be needed for the implementation of such a new arrangement?**

AMTA recognises that there is potential for such a replan to encompass a number of future uses. First, however, the ACMA should give due consideration to the international planning work being undertaken in this band regarding 3GPP work on LTE as well as PPDR before making a decision about the direction Australia should follow.

AMTA supports the ACMA exploring future use of this expanded band be based on an assessment against ACMA's Spectrum Management Principles as well as international harmonisation, equity and investment considerations (please see our responses to questions 1 and 19).

**11. The ACMA seeks comment on the costs to services listed in Table 3.1 if they are required to migrate out of the 850-865 MHz segment. What other spectrum could be used to continue these services?**

AMTA expects that many of these legacy services will migrate to IP based mobile services given enough time. This would preclude the need to allocate separate spectrum for these services in the longer term.

**12. The ACMA seeks comment on the possibility of using the 900 MHz expansion band, and the segments currently allocated to the trunked land mobile service, to expand the spectrum allocated to the cellular mobile telephone services (CMTS) by up to 2 x 20 MHz. This would result in up to 2 x 40 MHz of spectrum being available for CMTS. How much of the 900 MHz expansion band should be allocated to CMTS?**

See our response to question 9 above.

**13. Information is sought on the issues that would be raised by migrating land mobile services out of the 820-825 MHz paired with 865-870 MHz segments. What are the costs? How much time would be needed for such a migration?**

See responses to questions 10 and 11 above.

**14. The ACMA seeks information on the technical feasibility of a 5 MHz mid-band gap for CMTS. If not achievable, what is the minimum size of a mid-band gap? Why?**

AMTA's understanding is that a single band 805-845/850-890 MHz would not be technically feasible as the ratio between the pass band and the duplex gap is too large. To implement the 805-845/850-890 band with a dual-duplexer approach would require, as a rough approximation, a minimum gap of 10 MHz.

**15. The ACMA seeks comment on the possibility of using the 900 MHz expansion band to expand trunked land mobile services.**

AMTA does not believe the proposed use would be making the highest value use of the spectrum. Again, AMTA anticipates that trunked land mobile services will migrate to IP-based networks in the longer term and not require a separate allocation of spectrum.

**16. How much of the 900 MHz expansion band should be allocated to trunked land mobile services?**

Please see our response to question 15.

**17. The ACMA seeks comment on whether channel spacing should be halved and arrangements be based on 12.5 kHz and accommodate both analog and digital modulation.**

No comment.

**18. The ACMA seeks comment on whether the allocation to trunked land mobile should be retained or revert to conventional land mobile.**

Please see our response to question 15.

**19. The ACMA seeks comment on the possibility of using the 900 MHz expansion band for public protection and disaster relief (PPDR) radiocommunication systems. How much of the 900 MHz expansion band should be allocated to PPDR systems?**

AMTA is of the strong opinion that the requirements of PPDR can be met within existing and future public mobile broadband infrastructure. That is, commercial arrangements between Emergency Service Organisations and the carriers who operate mobile broadband networks would be the most cost effective method of meeting Australia's requirements for a public safety communications network. Such an arrangement would preclude the need for a separate and specific allocation of a band of spectrum for PPDR. A report by Access Economics, commissioned by the Attorney-General's department, also concluded that,

*“Based upon economic considerations, the optimal outcome for PSAs (Public Safety Agencies), the government, network carriers, and the economy as a whole would be a commercial arrangement, with PSAs negotiating access to a carrier’s network.”<sup>4</sup>*

If however, a separate public safety network was required by the Australian government it would be most sensible to operate services in spectrum that has already been identified within the Asia-Pacific region for PPDR. This would potentially allow for economies of scale to be realised in terms of network equipment and handsets. Harmonisation would also allow for interoperability across national borders.

AMTA notes the following international planning in this area:

- The ITU World Radio Conference in 2003 passed a resolution (Resolution 646) which encouraged administrations in the Asia-Pacific region to consider the use of spectrum within the 806-824 MHz and 851-869 MHz segments for advanced PPDR communications. The Asia Pacific Telecommunity (APT - the intergovernmental body that coordinates telecommunications and radiocommunications planning in the Asia Pacific region) is now exploring options for the implementation of PPDR services within these segments.
- Simultaneously the 3GPP international standards body is also considering two options for LTE mobile technology within the same spectrum segments: :
  - 2 x 18 MHz in the segments 806-824 MHz and 851-869 MHz; and
  - a 2 x 10 MHz extension of Band 5 to include the segments 814-824 MHz and 859-869 MHz.

#### **20. The ACMA seeks preliminary information on the organisations that should be allowed access to such an allocation and how it may be managed.**

MTA does not believe that it would be necessary to specify the types of end users who should be allowed access to the spectrum. Rather, the spectrum can be allocated in such a way that allows for use that is consistent with the objective of prioritising and meeting the requirements of Australia’s PPDR organisations. AMTA notes that a Steering Committee has been created for the purpose of identifying those requirements and ensuring that there is access to appropriate spectrum, under whatever arrangements prove most suitable, to meet those requirements.

#### **21. The ACMA seeks comment on whether there are other services that could make effective use of the 900 MHz expansion band. If so, what would be the best mechanism for giving those services access to the band?**

While AMTA does not have a view on what ‘other services’ could make effective use of the 900 MHz expansion band, we consider that any allocation for ‘other services’ must avoid existing or proposed 3GPP/ULTRA bands.

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<sup>4</sup> Radiofrequency spectrum options for Public Safety Agencies, Report by Access Economics Pty Limited for Attorney-General’s Department, 10 Sept 2010

**22. How much of the 900 MHz expansion band should be allocated to these services?**

Please see our response to question 21.

**23. The ACMA seeks comment on the options for the future licensing of the 805–825 MHz paired with 850–870 MHz segments.**

**(a) What are the issues associated with the different options?**

**(b) What are the costs and benefits to stakeholders of different arrangements?**

**(c) Are there any other licensing options that should be considered?**

No comment.

**24. The ACMA seeks information on any other issues that would benefit from being considered in reviewing arrangements in the digital CMTS segments (890–915 MHz paired with 935–960 MHz).**

It is AMTA's view that any change to the current arrangements in the 890 - 925 MHz paired with 935 – 960 MHz band should consider the following issues:

- current licensing arrangements, licence term and expiry date;
- current use of the band;
- the rights of incumbents under any re-arrangement and how they would be preserved; and
- how any transition would be effected in practice, given the extent of the use of the band and the very significant costs that would be incurred in migrating existing users either to different parts of the band or to entirely new bands

**25. The ACMA seeks comment on the replanning of the 890–915 MHz paired with 935–960 MHz segments using 5 MHz FDD paired blocks. Should this spectrum be replanned using 5 MHz FDD paired blocks? Should the planning arrangement in Figure 4.2 with five lots of 5 MHz FDD paired blocks be used or is there another arrangement that should be considered?**

AMTA believes it is important for the ACMA to give consideration to this part of the 900 MHz band and explore whether we can better configure it for future uses. It is equally important, however, that the ACMA give consideration to the question of the appropriate timeframe for possibly reconfiguring this segment of the band, noting that the timeframe will depend in part on global developments.

It will be necessary for the ACMA to give due consideration to existing investments and market forces and undertake consultation with stakeholders regarding the possible reconfiguration of this segment. The needs of incumbent users must be balanced against the need for flexibility in determining future uses within the band. As the

timeframes for clearing this segment of the band are as yet unknown and industry predicts that GSM may remain in use for at least another decade, we are still at the preliminary planning stage with regard to this spectrum. Much planning and consultative work remains to be done before the ACMA will be able to determine when legacy services will potentially be turned off and determining lot sizes is only one question to be answered in this entire process.

While AMTA supports the view that 5 MHz blocks are likely to be the most suitable for current 3G and future LTE services in the short to medium term, it is less clear looking further ahead whether 5 MHz blocks would continue to be the most appropriate.

In the short term AMTA's preference is to continue with the status quo of existing apparatus licensing arrangements, while a longer term strategy is defined through consultation with industry and taking into account global developments.

**26. Information is sought on the issues that would be raised by moving towards the planning arrangement in Figure 4.3, or any other arrangement it is believed should be considered. What are the costs and benefits? How much time would be needed for such a migration?**

There is potential risk here that a reconfiguration, if not done carefully, could disrupt significantly carriers' ability to continue to provide GSM services to legacy 2G customers and international roaming customers. The carriers are uncertain as to if or when 2G services will be discontinued.

AMTA suggests that the ACMA will need to consider the needs of legacy 2G customers carefully and base any replanning on the commercial viability of 2G networks, working in close consultation on this question with the respective licence holders.

Further, the commercial viability of 2G networks will also be dependent on carriers' contractual obligations with international roaming partners. While 2G remains the dominant technology worldwide there will continue to be a significant number of inbound roaming customers using 2G networks in Australia.

So while AMTA supports the longer term migration of this band to more advanced networks and technologies, this migration will certainly take some time and, during this process, we need to ensure service to existing customers is not disrupted and that inbound roamers will continue to be served.

AMTA, therefore, does not support any reconfiguration until the future of legacy GSM is clearer and timeframes for migrating roaming services are more certain. These concerns do not prevent the ACMA giving further thought to future long-term arrangements in the meantime.

**27. The ACMA seeks comment on the option of changing licensing arrangements in the digital CMTS segments irrespective of changes to planning arrangements. Information is sought on the preferred approach to licensing these segments in the future.**

AMTA would prefer not to see a two stage migration process regarding licensing arrangements. It would be more sensible to introduce spectrum licensing arrangements once GSM services are no longer commercially viable. Until then, the current licensing arrangements should remain in place.

**28. The ACMA seeks comment on the possibility of introducing spectrum licensing in the 890–915 MHz paired with 935–960 MHz segments. If spectrum licensing is chosen to license this band into the future, which allocation option should be used to establish new arrangements? Should it be one of the options detailed in section 4.4.1 or another option?**

No comment.

**29. Information is sought on the issues that moving towards a spectrum licensing regime in the 890–915 MHz paired with 935–960 MHz segments would raise. What are the costs? How much time would be needed for such a migration?**

AMTA does not support the move to spectrum licensing and a new configuration before legacy GSM services are decommissioned.

AMTA notes that the costs involved in moving to a spectrum licensing regime would include, but not necessarily be limited to:

- auction/Priced Based Allocation (PBA) preparation that would include demand and network modelling, network costing and economics, spectrum valuation, auction participation;
- cost of spectrum: payment up-front, compared to annual instalments;
- redistribution of network traffic to different parts of the band or to new bands and technologies, depending on auction/PBA outcome; and
- commercial negotiations with successful licensees for secondary market spectrum transactions, leases, or rights of use agreements, depending on auction/PBA outcome.
- Significant disruption to existing 2G customers if implemented before 2G services are no longer commercially viable

It is difficult to quantify these costs at present as most are dependent upon the reallocation propositions and outcomes.

The timeframes involved in any migration process are dependent upon the nature of the migration. If the migration was simply to replicate the status quo under spectrum licences, the migration process will be driven largely by the timing dictated by regulatory instruments.

However, if the migration involves the wholesale migration of millions of customers to other frequency bands and technologies, the process could take up to 5 years to avoid extensive commercial and customer dislocation and dissatisfaction.

The process used to turn off the AMPS network is illustrative in this case.

**30. The ACMA seeks comment on the desirability or otherwise of continuing an apparatus licensing regime in the 890–915 MHz paired with 935–960 MHz segments. If apparatus licensing is continued, which allocation method is preferred to establish new arrangements, if the segments are replanned as five lots of 5 MHz FDD paired blocks?**

AMTA has no objections to the continuation of apparatus licences for the 900 MHz band.

In the short to medium term, while GSM services are still required to be provided in this band in order to meet customer expectations and international roaming contractual commitments, the continuation of apparatus licensing is the preferred option.

Once GSM services are no longer making use of this spectrum AMTA members who hold licences in the 900 MHz band would consider moving to spectrum licensing arrangements, noting that there is a need to provide certainty for existing licensees regarding licence renewals to allow for investment and network planning decisions to be made.

**31. Information is sought on the issues that any change to current apparatus licensing arrangements in the 890–915 MHz paired with 935–960 MHz segments would raise. What are the costs and benefits? How much time would be needed to implement any changes?**

Please see our responses to questions 24-30 above.

**32. The ACMA seeks comment on the preferred option for ongoing arrangements in the 890–915 MHz paired with 935–960 MHz segments. If this involves a variation to current arrangements, what issues associated with such a change should be considered in developing a transition plan? What are the costs and benefits? How much time would be needed to implement any changes?**

AMTA supports the move from apparatus to spectrum licensing in the 890-915/935-960 MHz paired segments, but any restructuring should not occur until GSM services are no longer commercially viable and are able to be decommissioned without adversely impacting customers. As per our response to question 26 above, such a determination about the commercial viability of GSM services would need to be made in close consultation with the incumbent licensees.

**33. The ACMA seeks comment on the proposed use of the CTS spectrum from 857–865 MHz for the expansion of the 900 MHz band. Are there other higher value uses for this spectrum?**

AMTA does not view CTS as being the most valuable use of this spectrum.

If this spectrum can be included in a new paired allocation which is supported with international band planning and technology developments, it is much more likely that a higher value use will be found.

**34. The ACMA seeks comment on the option of allocating all or part of the 928–933 MHz segment to support smart infrastructure services. The ACMA also seeks information on the technical characteristics of the technologies that would likely be used to support smart infrastructure in this segment, such as bandwidth and power characteristics.**

AMTA appreciates the benefits of smart infrastructure and is open to examining more closely the best way of supporting the growth of smart infrastructure in Australia.

While it is possible that some smart infrastructure services may require or benefit from dedicated spectrum, it is also quite likely that many others would be cost-effectively supported on existing and future mobile broadband networks.

AMTA therefore questions the viability and economic sense in building dedicated or duplicated infrastructure, along with dedicated spectrum allocations, for these types of services unless there are demonstrated specific or niche requirements which cannot reasonably be replicated on commercial networks.

**35. Information is sought on the issues that an allocation to support smart infrastructure services would raise. What are the costs and benefits? How much time would be needed to implement such an arrangement?**

Please see our response to question 34 above.

**36. Should the current allocations to the fixed service be retained?**

AMTA has no comments on questions 36-41.

**37. If so, is the current balance of segment sizes and channel widths correct?**

**38. What would be the cost of relocation of fixed services if they are displaced as a result of other planning options discussed in this paper?**

**39. The ACMA seeks information on services that could potentially utilise the 928–935 MHz segment.**

**40. Information is sought on the issues that an allocation to these services would raise. What are the costs and benefits? How much time would be needed to implement such an arrangement?**

**41. The ACMA seeks suggestions for additional issues to be considered as part of the 900 MHz review. What are the costs and benefits of any regulatory change associated with the additional issues?**