Parliamentary Joint Committee on Law Enforcement

Inquiry into

The spectrum for public safety mobile broadband

AMTA Submission – 12 June 2013

Introduction

The Australian Mobile Telecommunications Association (AMTA) welcomes the opportunity to provide information and an industry perspective to the Parliamentary Joint Committee on Law Enforcement's Inquiry into '*The spectrum for public safety mobile broadband*'.

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.

AMTA has been actively engaged with the Department of Broadband, Communications and the Digital Economy (DBCDE), the Attorney-General's Department (AGD) and the Australian Communications and Media Authority (ACMA) regarding spectrum requirements for public safety mobile broadband (PSMB) since 2011. AMTA has also previously provided evidence before the Senate Environment and Communications Committee on 8 August 2011 on this issue and refers the Committee to the transcripts of those previous hearings as a valuable source of information.

Provided below is a summary of the mobile industry's perspective and position as well as comments addressing the Inquiry's terms of reference.

Summary

Public Safety Agencies (PSAs) rely on both fixed and mobile telecommunication services when they respond to emergencies and extreme weather events. It is vital that PSAs have access to the latest technology in relation to mobile communications services.

A successful partnership already exists between PSAs and the mobile telecommunications industry and this partnership should be further developed and leveraged in any implementation of a nationally interoperable dedicated public safety mobile broadband (PSMB) capability. This co-operative partnership is evidenced by existing arrangements for formal liaison between carriers and PSAs through groups such as the National Emergency Communications Working Group (NECWG), the Emergency Call Service Advisory Committee (ECSAC) and the Communications Security and Enforcement Roundtable (CSER).

AMTA relies on the ACMA's findings (which were based on data provided by PSAs) and therefore supports the approach of the regulator, which in April 2013 affirmed the allocation of 10 MHz (2 x5 MHz) in the 800 MHz band to address the spectrum requirements of Australia's PSAs.

AMTA recognises the ACMA's extensive work in this area and that the allocation of 10 MHz of 800 MHz spectrum is likely to exceed the modelled requirements of a nationally interoperable dedicated PSMB capability. AMTA notes that the ACMA's modelling assumes that PSAs will also rely on 50 MHz of spectrum allocated in 4.9 GHz, the deployment of Cells on Wheels (COWs) and potential arrangements with commercial services to handle incidents or events where capacity could be an issue.

As Chris Chapman, Chair of the ACMA has stated:

"*The ACMA is expert in this space and has thought very carefully about the needs of PSAs. The process to establish those needs was rigorous and exhaustive. It delivers a total solution that enables PSAs to respond to emergencies and catastrophes*."[1]

The recommended allocation of 10 MHz of 800 MHz spectrum was originally announced in October 2012 by the then Attorney-General, Minister for Emergency Management, the Hon. Nicola Roxon MP and the Minister for Broadband, Communications and the Digital Economy, Sen. the Hon. Stephen Conroy, (the Minister) for the purposes of providing a dedicated channel for emergency services.

AMTA agrees with the Minister's statement that:

"*The Government considers the allocation of spectrum from the 800 MHz band to be the best option to meet the communication needs of our public safety agencies*." [2]

AMTA agrees with the ACMA's assessment and the Minister's view that the proposed allocation of 10 MHz from the 800 MHz band will be appropriate and adequate for the implementation of a national interoperable mobile broadband capability for PSAs. AMTA also notes that this band is internationally harmonised (under ITU Resolution 646) for public protection and disaster relief (PPDR) in the Asia-Pacific Region.

AMTA further notes that the New Zealand Government has recently announced that New Zealand PSAs have expressed a preference for spectrum for public safety purposes to be allocated from the extended 800 MHz band, in alignment with Australian and Asia-Pacific Regional band-plans.[3]

AMTA notes that the ACMA's comprehensive review of public safety spectrum requirements included a review of PSA use of the 400 MHz band and also identified 50 MHz of spectrum in the 4.9 GHz band to provide very high-speed, short range on-demand capacity to areas of high activity for support a wide range of public safety uses.

Finally, AMTA is actively engaged with the DBCDE, AGD and sub-committees of the Public Safety Mobile Broadband Steering Committee (PSMBSC) to progress the implementation of a nationally interoperable dedicated PSMB capability. The PSMBSC sub-committees are scheduled to provide a report to COAG in July 2013 in relation to arrangements to provide an overflow capacity from the proposed dedicated nationally interoperable PSMB capability to commercial mobile networks.

AMTA notes that the current plan of the PSMBSC is based on the assumption that States and Territories will fund and build separate core dedicated capabilities which are intended to eventually be interoperable.

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[1] 'ACMA Approach to Emergency Services Spectrum- sufficient, scalable, strong', ACMA website, 16 April 2013
[2] Senator the Hon Senator Conroy, Minister for Broadband, Communications and the Digital Economy, Media Release, 29 Oct 2012, "Spectrum for Public Safety Agencies"
[3] Minister Amy Adams, media release 21 Feb 2013 "*Next generation mobile technology a step closer*"; ZDNet 21 Feb 2013 NZ Plans 4G Spectrum Auction

AMTA notes that an Access Economics study commissioned by AGD found that:

"*Moreover, a private network using the 700MHz band could not viably be built to cover the entire landmass, or indeed population mass, of Australia:*

- *As outlined in Section 3, the costs of a private network using 700 MHz spectrum reaching 80% of the Australian population are estimated to be around $242 million in capital costs and $197 million in annual operating costs. The total costs of such a private network would exceed one using a commercial network reaching 99% of the population by hundreds of millions of dollars.*
- *If the private network were to be expanded to 99% of the population, Gibson-Quai-AAS estimates that the annual operating expenditure would increase more than tenfold."*[4]

It is simply unrealistic for the proposed dedicated PSMB capability to cover areas other than inner-metropolitan capital cities (and in some cases not even those areas) due to the investment needed to roll out and maintain network infrastructure.

The Access Economics study concluded:

"Based upon economic considerations, the optimal outcome for PSAs, the government, network carriers, and the economy as a whole would be a commercial arrangement, with PSAs negotiating access to a carrier's network. This approach would lead to a timely, relatively inexpensive and efficient outcome which makes allowance for the peaky nature of PSA spectrum activity and avoids the costly duplication of network infrastructure…" [5]

If the current plan to build dedicated PSMB capabilities in metropolitan areas is implemented, overflow arrangements with commercial mobile carriers will be necessary. AMTA believes that the engagement between industry and the PSMBSC sub-committee regarding overflow arrangements reflects the ongoing partnership and co-operation that exists between the mobile telecommunications industry and the PSAs and will be critical in the implementation of a national PSMB capability.

[4] Access Economics, *Radiofrequency Spectrum Options for Public Safety Agencies*, Sept 2010 (commissioned by Attorney-General's Department) p24
[5] Ibid pp29 & 30

Demand for mobile broadband services continues to grow

The actual and forecast growth in demand for mobile broadband is unrelenting. At 31 Dec 2012 there were 17.4 million mobile handset subscribers in Australia with internet access (an increase of 7% from the previous 6 months).[6]

According to the Australian Bureau of Statistics, the volume of data downloaded by mobile handsets increased 38% for the three months ending Dec 2012 compared to the three months ending June 2012.[7]

By way of background, the Australian mobile telecommunications industry now serves over 30 million subscriptions in a population of 23 million people (4 subscriptions for every 3 people) and estimates suggest 90% of subscribers will be using a smartphone by 2015.[8]

This growth trend is being experienced worldwide. Ericsson's Mobility Report found that global mobile data traffic doubled between Q1 2012 and Q1 2013, with around 50 % of all mobile phones sold globally in Q1 2013 being smartphones.[9] Ericsson forecasts mobile data to grow by 12 times between 2012 and 2018. This growth is predicted to be driven primarily by video. Ericsson further predicts that LTE (Long Term Evolution) subscriptions will reach 2 billion by 2018.[10]

The Australian mobile industry is committed to meeting the unrelenting growth in demand for mobile data and broadband services by investing in latest generation mobile technologies and network infrastructure across Australia.

Australian mobile carriers have invested $10+ billion in mobile networks, spectrum purchases and spectrum licence re-issue fees over the past two years. This investment includes carriers well developed plans for the roll-out of next-generation mobile data and broadband services, including the emerging machine-to-machine market.

It is also important to understand this increasing level of investment in the context of mobile infrastructure costs (including spectrum licences, network deployment to support latest generation technologies) while mobile industry revenues are under downward pressure for the first time ever.

In a post-Digital Dividend environment, continued mobile industry investment is essential for mobile carriers to be able to meet exponentially increasing consumer demand for mobile services, including mobile broadband. With next generation services being rolled-out by mobile carriers and an emerging machine-to-machine market, the need for spectrum for mobile broadband is as compelling as ever. AMTA notes that the ACMA is already moving to investigate further the spectrum demand for wireless access service.[11]

Against a background of strong demand the flow-on impacts of mobile telecommunications have recently been identified and discussed as playing an increasingly enabling role in Australia's

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[6] Australian Bureau of Statistics, Internet Activity – Mobile handset subscribers
[7] Ibid
[8] ACMA Communications Report 2011-12
[9] Ericsson Mobility Report, June 2013
[10] Ericsson Mobility Report, *On the Pulse of the Network Society*, Nov 2012

[11] Chris Chapman's speech, Commsday Summit, 10 April 2013

economy and contributing to rising productivity. According to a recent Deloitte Access Economics report, '*Mobile Nation'*, the current wave of mobile technologies will result in an estimated productivity benefit to the Australian economy of $11.8 billion from 2012 – 2025.

How much broadband spectrum law enforcement agencies need to be able to communicate safely and effectively during mission-critical events such as natural disasters and potential terrorist incidents

Radiofrequency spectrum is not of itself a technology but an important national resource. AMTA supports the ACMA's extensive work in identifying spectrum for the purposes of PSAs and public safety in Australia. AMTA notes that the ACMA's comprehensive review of public safety spectrum requirements included a review of PSA use of the 400 MHz band and also identified 50 MHz of spectrum in the 4.9 GHz band to provide very high-speed, short range on-demand capacity to areas of high activity for support a wide range of public safety uses.

AMTA recognises the ACMA's expertise and relies on the findings that support its allocation of 10 MHz (2 x5 MHz) in the 800 MHz band to address the spectrum requirements of Australia's PSAs.

AMTA recognises the extensive modelling work undertaken by the ACMA and supports its conclusion that 10 MHz of 800 MHz spectrum is likely to exceed the modelled requirements of a nationally interoperable dedicated PSMB capability. In fact, the ACMA's modelling showed the 2 x 3 MHz of spectrum would be more than sufficient to meet the operational needs of PSAs.[12]

AMTA notes that the ACMA's modelling assumes that PSAs will also utilise 4.9 GHZ spectrum to assist in providing high-speed and capacity when required, as well as use COWs and commercial arrangements with mobile carriers to ensure capacity and coverage. Overflow arrangements with commercial carriers will be necessary if the current PSMBSC model of State and Territory funded dedicated core capabilities in inner-metropolitan areas is realised. Such a model will require billions of dollars of investment by State and Territory governments. AMTA notes that the option of relying completely on commercial arrangements with mobile carriers (who already have networks with extensive national coverage) to provide a nationally interoperable capability across Australia has not been considered by the PSMBSC and suggests that it is an option worthy of further consideration due to the investments required in building and maintaining dedicated network infrastructure.

The ACMA's modelling showed that 10 MHz of spectrum would be sufficient for public safety needs, apart from worst case scenario, "once a generation" events that would require multi-jurisdictional responses in an inner-metro area. Such an event can be accommodated by existing provisions of the Radiocommunications Act 1992. [13] Further, the ACMA modelling showed that even 20 MHz of spectrum would not be sufficient for such an event but the "once in a generation" likelihood of such an event occurring means that it would be inefficient and irresponsible to allocate more than 10 MHz of spectrum to cater for such a worst case scenario.

[12] 'ACMA Approach to Emergency Services Spectrum- sufficient, scalable, strong', ACMA website, 16 April 2013
[13] Division 1, Part 4.4 Declarations of an Emergency, the *Radiocommunciations Act 1992*

As Chris Cheah, ACMA Authority member, has stated,

"*The first is that, based on the recommendations in the steering committee's reports, the spectrum provided by the ACMA for PSMB is sufficient for all other scenarios modelled, including regional disaster responses. If the ACMA were to provide double the spectrum for the worst-case contingency, the evidence shows that in the absence of such an event occurring, the additional 10 MHz of spectrum would be largely underutilised. Given the rarity of this event occurring, this could mean that 10 MHz of spectrum in the 800 MHz band would effectively lie fallow permanently*."[14]

Further, AMTA notes that a dedicated PSMB capability will be just as susceptible to disruption from extreme weather events and natural disasters as commercial networks, so a dedicated PSMB capability will not guarantee that emergency services still have network access if commercial networks are disrupted. Commercial mobile networks can also be hardened to provide additional resilience. AMTA suggests that in regional and remote Australia it is likely to be more cost effective to harden commercial mobile networks than to build a separate dedicated PSMB capability.

Also, commercial network operators have extensive national field forces who respond to any cases of network disruption at extremely short notice; it is unclear if a dedicated PSMB capability would have or could have a comparable field force at its disposal in the event of network disruption.

This will mean that PSAs will rely on making arrangements with commercial mobile networks to cover regional and remote areas of Australia. AMTA notes that extreme weather events and natural disasters generally impact on outer-urban and regional areas of Australia more frequently than inner-metro areas.

This has also been an assumption of the ACMA:

"Well, first of all, a key part of a national PSMB network will be an ability to roam between the fixed PSMB network and commercial networks. While details of the implementation and business arrangements to make this happen are a long way from being addressed, stakeholders on all sides are in agreement that this will be a necessary component of the capability. The reason for this is that, while commitment to deploy fixed PSMB coverage differs from jurisdiction to jurisdiction, we know that fixed coverage will not even come close to that provided by the telcos. In fact, it is unlikely to extend beyond metro areas. This is a budgetary reality and has nothing to do with the ACMA or its decisions on spectrum for PSMB."[15]

AMTA also notes that the recent Boston bombings terrorist attack has been cited by the Police Federation of Australia as an example of commercial mobile networks failing. AMTA points out that the Boston authorities were not reliant on commercial networks. Also, the commercial networks were not hardened or prioritised for use by PSAs but were commercial, public mobile networks. Hardening of networks and prioritisation capabilities are possible using LTE (4G) technology. The commercial mobile networks in Boston did experience short-term issues with capacity due to the large volume of calls experienced immediately after the bombings. Restoration of service after any interruption is always a priority for carriers as evidenced by responses during natural disasters and

[14] Chris Cheah's speech to APCO (Association of Public Safety Communications Officials), 13 March 2013, Adelaide
[15] Ibid

extreme weather events in Australia. AMTA notes that mobile networks in Boston were rapidly restored. Further AMTA notes that mobile networks were not "shut down" at the request of law enforcement in Boston as has been claimed by the Police Federation of Australia (PFA) but stayed in operation providing vital communication services to citizens who were advised to use text messaging to ensure the networks could continue to carry traffic.[16]

In Australia, mobile network operators build, operate and maintain complex telecommunications networks which use network management processes, including active management of network alerts and monitoring of traffic levels, to manage networks effectively during emergency situations or natural disasters. This allows network operators to respond quickly to any sudden spikes in traffic loads and maintain the network's integrity and capacity to deal with emergencies or natural disasters.

The emergency call service allows Australians to access help from ESOs by calling Triple Zero (000 and 112) or the NRS (106) and it is also a vital part of our telecommunications networks capacity and effectiveness in warning the community during natural disasters as well as being a means of providing emergency assistance to Australians on a daily basis.

The public telecommunications networks, including mobile networks, allow Australians to make free calls to Triple Zero and the NRS (on 106) in emergencies which are prioritised traffic on networks. The telecommunications industry has been proactive in ensuring access to Triple Zero and the NRS for all Australian users of telecommunications services. Experience with recent warnings and notifications sent by some State-based ESOs to the ECPs is assisting the ECPs to put in place the resources and systems in preparation to receive an increase in the number of emergency calls.

In times of disaster it is not spectrum that is important in maintaining communications but geographically diverse traffic routes from the radio network to the end destination and an ability to switch traffic between various networks. Traffic through a single network, even with geographically diverse routing can be subject to failure and cannot be relied upon as has been seen in recent events in Queensland and the Overflow Working Group will need to investigate how to address this issue.

AMTA has been actively engaged with the PSMBSC sub-committee responsible for investigating potential arrangements for handling how a dedicated PSMB network will overflow into commercial mobile networks and is committed to continuing to progress this work.

AMTA suggests that the successful deployment of a nationally interoperable dedicated PSMB capability will rely more on the well-established partnership between PSAs and the mobile telecommunications industry than it will on an allocation of spectrum.

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[16] http://www.amta.org.au/articles/Boston.cell.networks.stay.online.afterblasts; http://edition.cnn.com/2013/04/16/tech/social-media/social-media-boston-fakes; http://thelede.blogs.nytimes.com/2013/04/15/live-updates-explosion-at-boston-marathon/#cell-phone-service-in-boston-shutd;

In conclusion, AMTA supports the ACMA analysis that an allocation of 10 MHz of spectrum will be more than adequate for the needs of a nationally interoperable PSMB capability. AMTA considers that PSAs will need to make arrangements with commercial mobile networks (to provide both the requisite coverage and capacity) irrespective of how much spectrum is allocated due to constraints imposed by Australia's geography and population patterns as well as the high costs involved in building and maintaining mobile network infrastructure.

Which of the 700 or 800 MHz bands is the most appropriate for law enforcement agencies given the current licensees occupying spectrum

AMTA believes that the Government and the ACMA have given exhaustive and rigorous consideration to this issue and its decision in the ACMA's words "*delivers a total solution that enables PSAs to respond to emergencies and catastrophes*".[17]

While AMTA welcomes the opportunity to present industry's views to the Parliamentary Joint Committee on Law Enforcement's Inquiry, the Association also presented evidence to the Senate Environment and Communications Reference Committee Inquiry in August 2011.

AMTA notes that that Committee reported in November 2011:

"*…the Committee does not have the technical expertise to recommend whether this spectrum should be in the 700 MHz band or 800 and 900 MHz bands. The Committee notes that the DBCDE, the ACMA and the Attorney-General's Department are currently engaged in a process to examine this question."*

Further, on the question of the suitability of 700 MHz spectrum versus 800 MHz spectrum, AMTA refers the Committee to a response provided to questions taken on notice by DBCDE to the Senate Committee Inquiry in 2011. This response refuted claims submitted at the time by the Police Federation of Australia that 700 MHz spectrum was any more suitable than 800 MHz spectrum for the purposes of public safety.[18]

AMTA recognises the extensive work undertaken by the ACMA and the PSMBSC since August 2011 with regard to the spectrum requirements for a nationally interoperable PSMB dedicated capability.

The allocation of 10 MHz of 800 MHz spectrum was originally announced in October 2012 by the then Attorney-General, Nicola Roxon and the Minister for Broadband, Communications and the Digital Economy, Stephen Conroy, for the purposes of providing a dedicated channel for emergency services.

[17] 'ACMA Approach to Emergency Services Spectrum- sufficient, scalable, strong', ACMA website, 16 April 2013
[18] DBCDE Answers to questions taken on notice, #16, 9 April 2011, Inquiry into capacity of communications networks

AMTA agrees with the Minister's statement that:

"*The Government considers the allocation of spectrum from the 800 MHz band to be the best option to meet the communication needs of our public safety agencies."* [19]

AMTA considers that the proposed allocation of 10 MHz of 800 MHz band spectrum will be appropriate and adequate for the proposed implementation of a national interoperable mobile broadband capability for PSAs and notes that this band is also internationally harmonised (under ITU Resolution 646) for public protection and disaster relief (PPDR) in the Asia-Pacific Region. Further, international standards for LTE equipment being developed by the 3rd Generation Partnership Project (3GPP) include the 800 MHz band (band 27). This means that economies of scale benefits in relation to handsets and network equipment could be realised if the 800 MHz band is used for Australia's PSMB capability.

While the Asia-Pacific 700 MHz band-plan has been adopted not only throughout the Asia-Pacific region, but also in the many larger Latin American countries, including Mexico and Brazil, it differs markedly from the unique US plan for this band. So, not only is the 700 MHz band not recognised by the ITU-R Resolution 646 that addresses PPDR harmonisation, there is no prospect to leverage US public safety developments as some would hope, since the band structures are not compatible - and would involve significant and costly customisation of US user devices to be operable within the unsold Australian spectrum blocks.

AMTA further notes that New Zealand Government has recently announced that New Zealand PSAs have expressed a preference for spectrum for public safety purposes to be allocated from the extended 800 MHz band, in alignment with Australian and Asia-Pacific Regional band-plans.[20]

Also, spectrum in the 700 MHz band has been identified for purposes of IMT, with Part 2, Section 2.2 (1) of the *Radiocommunications Spectrum Marketing Plan (700 MHz Band) 2012* stating that 'no part of the spectrum in the 700 MHz band is reserved for public or community services'.

AMTA notes that while under current ACMA plans the 700 MHz band may be cleared sooner than the 800 MHz band, there is scope to prioritise clearing the 800 MHz in metropolitan regions and making it available for use for public safety purposes before the entire band is cleared. AMTA points out, however, the need for funding commitments to build dedicated PSMB capabilities in metropolitan areas may delay use of the 800 MHz spectrum even once it is cleared on the current ACMA timetable.

In conclusion, AMTA supports the recommendation of the PSMBSC and also the ACMA that the 800 MHz band is appropriate for public safety use in Australia. AMTA notes that public safety use of 800 MHz spectrum is appropriate whether this use is made by a nationally interoperable dedicated PSMB capability, built and maintained by State and Territory governments, or whether arrangements are made with commercial mobile networks to provide a national PSMB capability.

[19] Senator the Hon Senator Conroy, Minister for Broadband, Communications and the Digital Economy, Media Release, 29 Oct 2012, "Spectrum for Public Safety Agencies"
[20] ZDNet 21 Feb 2013 NZ Plans 4G Spectrum Auction

Appendix A:

Terms of Reference

Pursuant to the committee's functions set out in subsection 7(1)(e) of the Parliamentary Joint Committee on Law Enforcement Act 2010, the committee will inquire into and report on:

(a) how much broadband spectrum law enforcement agencies need to be able to communicate safely and effectively during mission-critical events such as natural disasters and potential terrorist incidents;

(b) which of the 700 or 800 MHz bands is the most appropriate for law enforcement agencies given the current licensees occupying spectrum;

(c) how the necessary spectrum for public safety should be secured in a timely manner;

(d) what arrangements should be put in place to ensure that, in extreme circumstances, law enforcement agencies can effectively use spectrum of commercial carriers to protect public safety and maintain public order;

(e) what applications dependent on broadband spectrum will contribute significantly to saving lives and property;

(f) the impact on law enforcement agencies which utilise the available spectrum in relation to budgets, implementation strategies, current infrastructure and existing technology; and

(g) any other related matters."