Chapter 2

Availability of spectrum for public protection and disaster relief radiocommunications

2.1 This chapter examines the availability of spectrum for use by emergency service organisations (ESOs) for both narrowband and broadband public protection and disaster relief (PPDR) radiocommunications.

2.2 Narrowband radiocommunications refers to voice communications, for example two-way radio. ESOs in Australia typically use spectrum in the 400 MHz band for their narrowband voice communications.

2.3 Broadband radiocommunications refers to data communications, such as mobile internet used to transmit photos, videos and maps. The possible future use of spectrum in the 700 MHz band or 800 and 900 MHz bands for broadband radiocommunications by ESOs is the subject of much of this chapter.

2.4 ESOs were of the view they required dedicated broadband spectrum, in addition to their current narrowband spectrum allocations, to meet their needs as technology advances and data requirements increase. Some ESOs argued strongly for spectrum from the digital dividend (700 MHz band) whilst others were undecided about whether spectrum from the 700 MHz band or 800 and 900 MHz bands should be allocated for PPDR in Australia, so long as a suitable allocation of broadband spectrum is made. Telecommunication organisations contested the suggestion that ESOs required dedicated broadband spectrum for PPDR radiocommunications and opined that the 700 MHz band should be allocated to telecommunications companies for commercial use.

Narrowband communications

Use of the 400 MHz band and interoperability of voice communications

2.5 At present, the 400 MHz band is used by federal, state and territory ESOs for narrowband radiocommunications. The police, fire and ambulance services in every state and territory except Tasmania, as well as the Australian Federal Police (AFP) and Australian Customs and Border Protection Service (Customs), currently use spectrum in this band (see Figure 2). The Tasmanian police service uses spectrum in the 800 MHz band.[1]

---

1 Australian Communications and Media Authority (ACMA), *Spectrum Proposals: 403–520 MHz Proposals for future arrangements in the 400 MHz band*, March 2009, available: www.acma.gov.au/webwr/_assets/main/lib310832/ifc08-2009_spectrum_proposals_403-520_mhz.pdf (accessed 6 September 2011), p. 88.

Figure 2—Overview of existing voice radiocommunications used by federal, state and territory agencies

State	Agency	VHF	403–420 MHz	420–430 MHz	450–470 MHz (LEPS)	480 MHz (CT)	500–520 MHz (Spectrum Licence)	800 MHz	Comments
New South Wales	Police								Police have flagged intention to join GRN when possible
	Fire		State GRN						
	Ambulance								
	Other government								
Victoria	Police	SMR Rural Service	MMR				MMR In-building		
	Fire								
	Ambulance								
	Other government								
Queensland	Police								Trailing IDAS radios for ambulance services
	Fire	Rural Service			Not in LEPS				
	Ambulance				Not in LEPS				
	Other government								
South Australia	Police		State GRN						
	Fire								
	Ambulance								
	Other government								
Western Australia	Police				Outside of metro				2006 new roll out of ES network that is dual band VHF/UHF
	Fire								
	Ambulance								
	Other government				SES				
ACT	Police								
	Fire		NSW GRN						
	Ambulance								
	Other government								
Northern Territory	Police				State GRN				New P25 emergency services network planned for 2010+ 403-430 MHz
	Fire								
	Ambulance								
	Other government								
Tasmania	Police								
	Fire								
	Ambulance								
	Other government								
Commonwealth	AFP								
	Customs								

Technology		
Trunked	Smartzone P25	
	Smartzone 4.1	
	Smartzone 3.0	
	EDACS	
	MPT1327	
	Astro 25	
Conventional	Analog PMR	
	P25	

Glossary	
GRN	Government Radio Network
SMR	State Mobile Radio
MMR	Metropolitan Mobile Radio
IDAS	ICOM Digital Advanced System
P25	APCO Project 25
EDACS	Enhanced Digital Access Communication Systems

Source: courtesy of the ACMA

2.6 Narrowband spectrum such as in the 400 MHz band, can be used for voice communications but cannot be used effectively for data radiocommunications because the size of each spectrum allocation is too small to enable the transmission of large files such as photos, videos and maps. Motorola Solutions explained why narrowband spectrum should not be used for data applications:

> ...a system that makes use of 20 MHz of spectrum (10 MHz for the downlink and 10 MHz for the uplink, or 10+10 MHz) will have more bandwidth available on a per-sector basis than a system that deploys a total of 10 MHz of bandwidth (a 5+5-MHz system). The difference is roughly 50%; that is, in a 20-MHz system, the network operator will have twice the available bandwidth than a network operator that builds out a system in only 10 MHz of spectrum.
>
> The consequence of insufficient spectrum is restricted capacity, which combined with high demand, causes network congestion. For applications, this means sluggish behaviour or outright failures. Beyond sluggish performance in congestion situations, there is also the high likelihood that networks simply have to drop packets of data. Packets arrive at a base station over a high-speed connection such as fiber but then the base station forwards the packets using the slower radio connection. If there are too many incoming packets the inevitable result is that the base station, or infrastructure nodes prior to the base station, will drop or significantly delay packets.
>
> Consequences of such congestion are not just slower performance but also application failures. Most communications protocols implement timeouts on their operations, including Transmission Control Protocol (TCP) itself, the packet-transport protocol used in the Internet to provide reliable end-to-end delivery. With large delays or dropped packets, communications protocols attempt to deliver data reliably, but at some level of congestion, they can no longer cope properly, and applications will either indicate a failure, or worse yet, require an application or full-system restart.[2]

2.7 The AFP and Australia New Zealand Policing Advisory Agency (ANZPAA) indicated that ESOs have a growing need for broadband spectrum as they implement increasingly sophisticated tools, for example automated number plate recognition and 'biometric infield wireless radio detection systems', for which narrowband spectrum is unsuitable.[3]

2.8 The AFP explained that Australian police services (state, territory and federal) would continue to use 400 MHz spectrum for voice communications and were seeking to achieve interoperability:

---

2 Motorola Solutions, *Supplementary Submission 10*, pp 6–7.

3 Mr Andrew Scipione, Board Member, Australia New Zealand Policing Advisory Agency (ANZPAA), *Proof Committee Hansard*, 9 August 2011, p. 6; and
Deputy Commissioner Michael Phelan, Close Operations Support, Australian Federal Police (AFP), *Proof Committee Hansard*, 8 August 2011, p. 3.

> Apart from us all trying to move towards something in the next five years, on the voice side, with ACMA, we are looking at harmonisation across the 400-megahertz spectrum, which involves all voice communications. We are trying to do our best to harmonise all the equipment in the spectrum available there.[4]

2.9 The Australian Communications and Media Authority (the ACMA) confirmed that ESOs are moving towards interoperability of voice communications in the 400 MHz band:

> ...we now have an agreement between all the states and territories to move towards interoperability for narrowband communications in accordance with a COAG plan. That plan will come into being around mid-2020. That is its final date. The reason it is so far out is that some states, such as Tasmania, have bought equipment and are operating in other bands. Tasmania operates in part of the [900] megahertz band, not the 700. The 700 is purely full of television broadcasting at the moment. So they are a bit higher up—they are actually in the [900] megahertz band—and they use narrowband. Western Australia is in the 500 megahertz band.
>
> We want all of the states eventually to be in the 400 megahertz band, but we understand that they are all in different places in their procurement cycles and it would be unreasonable for us to expect them to shut off equipment that still has a reasonable life. The plan is flexible, but we would expect that sometime between 2015 and 2020 all of those states and territories come into the 400 megahertz band for their narrowband communications and operate within the parameters of the COAG agreement. This has been agreed at COAG but it has also been agreed by the NCCGR, the National Coordination Committee for Government Radiocommunications.
>
> Both Tasmania and Western Australia operate in different bands but they will come back into the 400 megahertz band...[5]

Committee view

2.10 The committee recognises the need for nation-wide interoperability of narrowband voice radiocommunications systems to enable effective communication between state, territory and federal ESOs during times of emergency. The need for interoperability has been acutely demonstrated by the difficulties encountered during, and lessons learnt following recent natural disasters. The committee supports the COAG agreement to achieve interoperability of ESO narrowband voice radiocommunications in the 400 MHz band, and recommends that this is achieved as soon as practicable, noting the constraints necessitated by jurisdictional procurement timeframes.

---

4 Deputy Commissioner Michael Phelan, Close Operations Support, AFP, *Proof Committee Hansard*, 8 August 2011, p. 2.

5 Dr Andrew Kerans, Executive Manager, Spectrum Infrastructure Branch, ACMA, *Proof Committee Hansard*, 9 August 2011, pp 34–35.

Recommendation 1

2.11 The committee recommends that interoperability of narrowband voice radiocommunications between federal, state and territory emergency service organisations is achieved as soon as practicable and that all services attending major incidents be compelled to maintain a common emergency communications platform to ensure seamless real time communication from and to the Incident Controller.

Broadband communications

Current use of the 700 MHz band

2.12 As discussed briefly in Chapter 1, the 700 MHz band is currently used for analog free-to-air television. However, as Australia switches to digital television, radiofrequency spectrum from 694 to 820 MHz will become vacant. It is the federal government's intention to auction 2x45 MHz of this spectrum during the second half of 2012.[6]

Use of the 800 and 900 MHz bands

2.13 Radiofrequency spectrum from 820–890 MHz in the 800 MHz band and 890–960 MHz in the 900 MHz band is currently used for:

- land mobile;
- cellular mobile telephone service (CMTS);
- fixed point to point (P2P);
- cordless telephone service (CTS);
- digital CMTS;
- industrial, scientific, medical (ISM);
- radio-location; and
- digital short range radio (DSRR).[7]

2.14 As discussed in Chapter 1, the ACMA is currently conducting a review of the 800 and 900 MHz bands (the "900 MHz band review"). This review includes

6 ACMA, 'ACMA moves ahead with auction of spectrum in the 700 MHz (digital dividend) and 2.5 GHz bands', Media release 50/2011, 27 May 2011.

7 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, available: www.acma.gov.au/webwr/_assets/main/lib312085/900mhz_review-exploring_new_opportunities.pdf (accessed 5 October 2011), p. 50.

consideration of 'the possibility of using the 900 MHz expansion band for public protection and disaster relief (PPDR) radiocommunication systems'.[8]

International use of spectrum

700 MHz spectrum

United States of America

2.15 The United States of America (USA) has announced its intention to deploy a public safety mobile broadband network in the 700 MHz band.[9]

2.16 In July 2007, the US Federal Communications Commission (FCC) adopted the *700 MHz Second Report and Order* that established:

> ...a regulatory framework for the 700 MHz public safety band to facilitate the establishment of a nationwide, interoperable broadband communications network for the benefit of state and local public safety users. The FCC allocated 10 MHz of 700 MHz spectrum for an advanced, public safety broadband network to be implemented by a public/private partnership. The parties are required to adopt, subject to ultimate FCC approval, a broadband standard with a nationwide level of interoperability.[10]

2.17 The *700 MHz Second Report and Order* allocated sections of the 700 MHz Public Safety Band (763–768/793–798 MHz) for broadband communications.[11]

2.18 The FCC also established a single nationwide "Public Safety Broadband License" (PSBL) for the 700 MHz public safety broadband spectrum.[12] On 19 November 2007 the Commission assigned this licence to the Public Safety Spectrum Trust Corporation (PSSTC). The FCC stated:

> The PSBL and...commercial licensee will form a Public Safety/Private Partnership to develop a shared, nationwide interoperable network for both

---

8 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 34.

9 DBCDE, *Fact sheet 4: Public safety mobile broadband capability 800 MHz band spectrum—international frameworks and trends*, available: www.dbcde.gov.au/__data/assets/pdf_file/0018/139122/Fact_sheet_4-800_MHz_band_spectrum-international_frameworks-and_trends.pdf (accessed 19 October 2011), p. 1.

10 US Federal Communications Commission (FCC), *Public Safety and Homeland Security Bureau: Interoperability*, available: http://transition.fcc.gov/pshs/emergency-information/interoperability.html (accessed 19 October 2011).

11 FCC, *700 MHz Second Report and Order*, July 2007, available: http://fjallfoss.fcc.gov/edocs_public/attachmatch/FCC-07-132A1.pdf (accessed 19 October 2011), p. 128.

12 FCC, *Public Safety and Homeland Security Bureau: Public Safety/Private Partnership*, available: http://transition.fcc.gov/pshs/public-safety-spectrum/700-MHz/partnership.html (accessed 19 October 2011).

> commercial and public safety users. This network will provide public safety entities access to new broadband technologies across the country.
>
> ...
>
> The public safety broadband network will facilitate effective communications among first responders not just in emergencies, but as part of cooperative communications plans that will enable first responders from different disciplines, such as police and fire departments, and jurisdictions to work together in emergency preparedness and response.
>
> Under the Partnership, the PSBL will have priority access to the commercial spectrum in times of emergency, and the commercial licensee will have pre-emptible, secondary access to the public safety broadband spectrum. Providing for shared infrastructure will help achieve significant cost efficiencies while maximizing public safety's access to interoperable broadband spectrum.[13]

2.19 The Department of Broadband, Communications and the Digital Economy (DBCDE) and the ACMA advised the committee that the band plan in which the US 700 MHz public safety mobile broadband network has been allocated is not in alignment with the 700 MHz band plan adopted in Australia. As a result, DBCDE and ACMA stated that US 700 MHz public safety equipment (for example handsets) would not be able to operate in Australia even if ESOs were allocated a portion of the 700 MHz band in Australia.[14]

Asia Pacific

2.20 The Asia-Pacific Telecommunity Wireless Group (AWG) has been considering harmonisation of the 700 MHz band planning arrangements in the Asia Pacific region.[15] The AWG's proposal for harmonisation of the 700 MHz band includes a guard band from 803–806 MHz which means (given the difference in Australian digital dividend arrangements compared to other Asia Pacific countries):

> ...a decrease in the size of the guard band at the upper boundary of the 700 MHz plan can also be considered in Australia. This would enable additional spectrum to be included in the expansion of the 900 MHz band [in Australia].[16]

---

13 FCC, *Public Safety and Homeland Security Bureau: Public Safety/Private Partnership*, available: http://transition.fcc.gov/pshs/public-safety-spectrum/700-MHz/partnership.html (accessed 19 October 2011).

14 DBCDE and ACMA, *Personal communication*, 31 October 2011.

15 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 27.

16 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 28.

800 and 900 MHz spectrum

United States of America

2.21 According to the ACMA, arrangements in some parts of the 800 and 900 MHz bands in the USA 'have some similarities to those in Australia'.[17]

2.22 The 806–824 MHz segment together with 851–869 MHz segment are allocated to the Public Safety Radio Service for emergency dispatch, two-way voice communications, mobile repeaters, interoperability and secondary fixed links.[18] The 824–849 MHz paired with 869–894 MHz segments are used for cellular radiotelephone services in the USA.[19] Above 890 MHz, arrangements in the USA differ from those in Australia. There is no allocation for digital CMTS in the 900 MHz band in the USA.[20] The upper part of the 900 MHz band is used in the US for a variety of services including paging and radiotelephone services, narrowband personal communications services, multiple address services and specialised mobile radio.[21]

Europe

2.23 In Europe, there are similarities with Australian arrangements for the use of the upper part of the 900 MHz band.[22] Australia adopted the global system for mobile communications (GSM) standard from Europe and as a result, the Australian allocation for digital CMTS is the same as that used mostly for GSM in Europe.[23] The use of 915–935 MHz for defence in Europe overlaps with defence use of 915–928 MHz in Australia.[24]

2.24 Use of the rest of the 900 MHz band differs between Europe and Australia. The European digital dividend (790–862 MHz) is substantially different from the

---

17 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 24.

18 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 24.

19 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 25.

20 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 25.

21 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 25.

22 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 25.

23 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 25.

24 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 25.

Australian digital dividend and overlaps a lower portion of the 900 MHz band.[25] Other uses of the 900 MHz band in Europe include extension of the GSM segments, railway communications and land mobile services.[26]

Asia Pacific

2.25 Parts of the 900 MHz band are being considered by the Asia-Pacific Telecommunity Wireless Group (AWG) for harmonised public protection and disaster relief (PPDR) radiocommunications systems across Region 3 (see discussion in Chapter 1).[27] Specifically, the Asia-Pacific Telecommunity (APT) is considering the 806–824 MHz band together with the 851–869 MHz band:

> ...for harmonised PPDR across some countries in Region 3. These segments are already allocated for PPDR systems in some Region 3 countries, including Korea. The PPDR systems currently used internationally in this segment are based on narrowband technologies. It has been proposed that the AWG also consider developing harmonised plans to enable broadband technologies based on work currently underway in 3GPP.[28]

Spectrum for broadband PPDR radiocommunications in Australia

2.26 During the course of the inquiry, ESOs consistently raised their need for dedicated broadband spectrum particularly as their data requirements continue to increase with technological advances (for example automated number plate recognition and in-field fingerprint identification).[29] The AFP explained '[d]ata communications and the level of traffic every year is growing exponentially'[30], while the NSW Government described the challenges for ESOs using existing commercial networks for data services:

> ...we need access to systems for people, we need access to spectrum for governments so that we can run our radio networks and we need access to spectrum for our data networks as well. Failing that—and you will hear a lot about that discussion around the data services—we need access to dedicated parts of the commercial network because, while the commercial networks

25 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 25.

26 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 25.

27 The International Telecommunication Union (ITU) defines Region 3 as Asia and Australasia.

28 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 34.

29 For example Tasmania Fire Service, *Submission 23*, p. 4; Fire and Emergency Services Agency of Western Australia (FESA), *Submission 18*, p. 4; and NSW Government, *Submission 41*, pp 17–18.

30 Deputy Commissioner Michael Phelan, Close Operations Support, AFP, *Proof Committee Hansard*, 8 August 2011, p. 3.

> prove very effective, they are prone to congestion and emergency services need to be able to communicate in emergency situations.[31]

2.27 ESOs, however, had mixed views about what spectrum best suited their broadband radiocommunication needs and should therefore be allocated for PPDR. Some ESOs, for example the Fire and Emergency Services Agency of Western Australia (FESA) and the Police Federation of Australia (PFA), recommended allocation of spectrum from the digital dividend.[32] Other ESOs were undecided about whether spectrum in the 700 MHz band or 800 and 900 MHz bands would be preferable, but agreed that dedicated spectrum was required for broadband PPDR radiocommunications.[33]

2.28 A comparison of the 700 MHz band and 800 and 900 MHz bands is below.

2.29 Telecommunications organisations, such as Telstra and the Australian Mobile Telecommunications Association (AMTA), disagreed with the proposition that ESOs required dedicated spectrum for broadband communications and that spectrum for this purpose be allocated from the digital dividend.

2.30 Telstra claimed that a separate mobile network owned and operated by ESOs was:

> ...not the best way of achieving the desired outcome. Instead, it would be more economic and effective to incorporate the ESO requirements into existing commercial mobile networks. Telstra believes that the building of a new mobile network is unnecessary and would be unduly costly.[34]

2.31 Telstra stated its strong opposition to the reservation of digital dividend spectrum for ESOs on the basis:

- it would inhibit the ability of the commercial operators to deliver the full economic potential of the digital dividend spectrum, and the nation would incur an economic loss;
- due to the high costs involved, the high risk that the spectrum would remain largely unused; and

---

31 Mr Tony Gates, Director, Operations, Telco Authority, NSW Government, *Proof Committee Hansard*, 8 August 2011, p. 25.

32 FESA, *Submission 18*, p. 4 and Police Federation of Australia (PFA), *Submission 11*, pp7–8.

33 See Deputy Commissioner Michael Phelan, Close Operations Support, AFP, *Proof Committee Hansard*, 8 August 2011, p. 5 and Mr Tony Gates, Director, Operations, Telco Authority, NSW Government, *Proof Committee Hansard*, 8 August 2011, pp 30–31.

34 Telstra, *Submission 31*, p. 22.

- such a reservation would be unique to Australia and not harmonised with the frequencies that have been identified by the International Telecommunications Union (ITU) for PPDR use across the Asia-Pacific region.[35]

2.32 AMTA concurred.[36] Mr Chris Althaus, Chief Executive Officer of AMTA, argued the best outcome—from a cost-benefit and service delivery perspective—would be for ESOs to partner with the telecommunications industry.[37] Mr Althaus stated:

> ...as an industry we have a community and a social responsibility to respond to the needs of the Australian people during times of crisis, and the partnership with the ESOs is a key feature.
>
> ...
>
> We are the providers of that service who can best provide that. Leave emergency services to what they do best. Running networks and providing communication services is what we do best.[38]

2.33 DBCDE and the ACMA clarified the federal government's proposal to allocate spectrum for broadband PPDR radiocommunications in Australia:

> The frequency range currently proposed to be earmarked for allocation for public safety broadband use in Australia is a portion within the frequency range 805-820 MHz paired with a portion within the frequency 850-870 MHz.
>
> The lower segment (805-820 MHz) will be released as part of Australia's 'digital dividend' band (694-820 MHz) via the switchover from analog to digital television and the relocation – or 'restacking' – of digital broadcasting services out of this band. Legislative amendments passed by the Parliament in May 2011 set a deadline of 31 December 2014 for completion of the restack.
>
> The upper segment (850-870 MHz) is currently used for various services, including point-to-point services and trunked land mobile services. Within this spectrum, 865-870 MHz is currently allocated for trunked land mobile services.
>
> The ACMA has commenced a review of future arrangements for the 800/900 MHz bands, and is empowered to review incumbents' spectrum holdings to relocate existing users under the regulatory framework...The ACMA is expected to release its decision on the revised planning arrangements for the 800/900 MHz bands in the second quarter of 2014, with implementation to commence shortly thereafter. It is expected that any

35 Telstra, *Submission 31*, pp 23–24.

36 Mr Chris Althaus, Australian Mobile Telecommunications Association (AMTA), *Proof Committee Hansard*, 9 August 2011, pp 5–6.

37 Mr Chris Althaus, AMTA, *Proof Committee Hansard*, 9 August 2011, pp 5–6.

38 Mr Chris Althaus, AMTA, *Proof Committee Hansard*, 9 August 2011, p. 6.

> allocation of spectrum from the 800 MHz band for public safety agencies would be available by 2015 – that is, in the same timeframe as the 700 MHz band.
>
> The amount of spectrum needed to deploy the mobile broadband capability sought by public safety agencies will be identified by the ACMA, in consultation with the Public Safety Mobile Broadband Steering Committee. The Steering Committee will work with the ACMA as part of the ACMA's review of the 800/900 MHz band to identify a suitable amount of spectrum necessary to meet foreseeable needs.[39]

2.34 DBCDE re-iterated the federal government's commitment to the development of a 'nationally interoperable mobile broadband capability for public safety agencies' through its participation in the Public Safety Mobile Broadband Steering Committee.[40]

700 MHz band or 800 and 900 MHz bands?

2.35 The PFA claimed the *Radiocommunications Act 1992* (the Act) required the government to make dedicated broadband spectrum available to ESOs because:

> ...it does not say that the Australian Communications and Media Authority must have regard to the needs of law enforcement and defence, for example. It says, "make adequate provision for". This is a very unusual provision, set out in the objects of the act. We believe that, if you accept that mobile broadband communications are part of the need of public safety agencies in the present era, then we believe that "making adequate provision" includes doing so for mobile broadband communications.[41]

2.36 On that basis, the PFA argued strongly for the allocation of spectrum from the 700 MHz band for broadband PPDR radiocommunications:

> The 700 MHz band is special. That is why it is sometimes referred to as 'the waterfront property' of spectrum. It is special because communications in this band can carry large amounts of data, at high speed, over long distances, and can penetrate buildings. It is ideal for mobile broadband services and for emergency and policing services at critical times of national emergency when normal radio and telephone communications are pushed to the limit or severely overloaded past breaking point.
>
> ...
>
> All of Australia's Police Commissioners from every State and Territory and the AFP have agreed that they need 20 MHz (10 +10 MHz paired) of this newly available 700 MHz band to establish a leading edge network for law

---

39 Department of Broadband, Communications and the Digital Economy (DBCDE), *Answer to question on notice*, 9 August 2011 (received 2 September 2011).

40 Mr Andrew Maurer, Assistant Secretary, Spectrum and Wireless Services, DBCDE, *Proof Committee Hansard*, 9 August 2011, p. 43.

41 Ms Dianne Gayler, Senior Policy Officer, PFA, *Proof Committee Hansard*, 8 August 2011, p. 11.

> enforcement and emergency services agencies. Premiers have written to Ministers and the Prime Minister supporting a proposal that the Gillard Government reserve 20 MHz for these vital essential services in the national interest. The matter was also raised at the February 2011 meeting of COAG. The Australasian Fire Authorities Council and the Council of Ambulance Authorities are each supporting the proposal.
>
> They are all convinced that it is not prudent or feasible to rely on commercial carriers from which they would buy the necessary communications services. They would essentially be at the mercy of a monopoly commercial carrier as far as price and quality of service are concerned. There are also serious concerns surrounding capacity, redundancy, security and reliability needed for such 'mission critical' purposes. Foreign ownership of such a carrier would jeopardize national security of critical information and communications.[42]

2.37 ANZPAA also advocated for the allocation of 700 MHz spectrum to ESOs. Mr Andrew Scipione, Board Member, ANZPAA outlined the following reasons for preferring the 700 MHz band over the 800 and 900 MHz bands:

- the time it would take to vacate spectrum in the 900 MHz band (re-stacking);
- the availability and cost of equipment for use on spectrum in the 800 and 900 MHz bands; and
- international harmonisation, particularly with Europe and the United Kingdom, and the interoperability of Australian police equipment with other police forces on international missions.[43]

2.38 Other ESOs were undecided about what spectrum should be allocated for broadband PPDR in Australia. The AFP's view was typical of these:

> ...my honest view is that I do not know whether 700 or [800 and 900] is the same or better or worse. I am not a technical expert. I have seen advice from both sides which have different views. I simply do not know. However, I do know that we need one of them, one or the other. As we move forward, law enforcement in particular and emergency services are going to need some sort of high-end broadband to be able to do our job. Situational awareness at the point where an incident occurs for people making command decisions is absolutely imperative. The more information you can get better decisions you will make. Could you imagine what it would have been like in 2003 at the time of the bushfires had we been able to send real live pictures of for example what was happening from our police and emergency officers at the scene back to the command centre. Much higher quality decisions can be made by command with the more information you have. That just stands to reason. While there is the capability to do it in terms of equipment, we still need the mechanism, the ability I suppose, to transmit the information. In

42 PFA, *Submission 11*, pp 7–8.

43 Mr Andrew Scipione, Board Member, ANZPAA, *Proof Committee Hansard*, 9 August 2011, pp 5–6.

> the future there is no doubt that law enforcement and emergency services need some sort of high end bandwidth in the wireless format.[44]

2.39 The NSW Government was equally undecided about whether spectrum from the 700 MHz band or 800 and 900 MHz bands would best suit ESOs' operational needs but agreed that dedicated broadband spectrum was required:

> Clearly we think access to some sort of data spectrum is really critical and there will be lots of people...who will say, 'We have to get access to 700.' There are people saying, 'The demand is too great; we have to look somewhere else.' But the issue..is that we need access to spectrum that meets operational purposes and it needs to be delivered to us in a way which we can afford because not only do we need spectrum but we need to then go off and build networks. The only alternative is to use commercial spectrum and if we are forced to use commercial spectrum then that will raise the issue of how we get reserve capacity in the commercial spectrum so that when my [state and territory] colleagues...are out in the field fighting fires and dealing with floods they actually have the service needed.
>
> ...I do not have a preference per se. If [800 and 900] can deliver the spectrum and it can be delivered commercially through available technology so that we do not have to go out and build new technology and if it can be delivered to meet the needs of emergency services at a reasonable cost I do not have a preference.[45]

2.40 In response to claims made by ESOs regarding the technical differences between spectrum in the 700 MHz band and the 800 and 900 MHz bands, the ACMA stated '[t]he propagation characteristics in 700 and [800 and 900] are identical. In building penetration issues they are exactly the same'.[46]

2.41 As to whether spectrum from the 700 MHz band or the 800 and 900 MHz bands would be best for broadband PPDR radiocommunications, the federal government is considering whether spectrum from the 800 and 900 MHz bands should be allocated for this purpose.[47] It is the government's intention that some of the 700 MHz band will be auctioned (for commercial use) during 2012.[48]

---

44 Deputy Commissioner Michael Phelan, Close Operations Support, AFP, *Proof Committee Hansard*, 8 August 2011, p. 5.

45 Mr Tony Gates, Director, Operations, Telco Authority, NSW Government, *Proof Committee Hansard*, 8 August 2011, pp 30–31.

46 Ms Maureen Cahill, General Manager, Communications Infrastructure Division, ACMA, *Proof Committee Hansard*, 9 August 2011, p. 36.

47 Attorney-General's Department, *Public Safety Mobile Broadband Steering Committee: Terms of Reference*, available: www.ag.gov.au/www/agd/agd.nsf/Page/National_security (accessed 19 October 2011), p. 1.

48 ACMA, *Allocation of the 700 MHz (digital dividend) and 2.5 GHz bands*, available: www.acma.gov.au/WEB/STANDARD/pc=PC_312315 (accessed 24 October 2011).

Availability and cost of equipment

2.42 The issue regarding the allocation of spectrum in the 700 MHz band or 800 and 900 MHz bands for broadband PPDR radiocommunications was related to concerns about the relative availability and cost of equipment for use on either the 700 MHz band or 800 and 900 MHz bands.[49] Motorola Solutions explained:

> The relatively small public safety [800 and 900] MHz [long term evolution] market size globally and departure from the Region 3 band plan will limit availability of chipsets and devices for public safety organisations. This will lead to reduced competition and consequential higher prices for products, and lack of advanced features as the technology evolves over future decades.[50]

2.43 ANZPAA and the PFA agreed and argued that allocating spectrum from the 800 and 900 MHz bands for broadband PPDR radiocommunications would mean ESOs incurred greater equipment costs as they would have to pay for purpose-built rather than off-the-shelf equipment.[51]

2.44 ANZPAA went on to concede that the allocation of spectrum for broadband PPDR radiocommunications was a commercial decision for government but indicated that financial support—particularly for equipment costs—would be required from the Commonwealth Government if ESOs were allocated spectrum in the 800 and 900 MHz bands:

> Can I just say that this will be a commercial decision. Clearly, that is the case. We are asking what we believe is for a very small portion of a very lucrative area within the spectrum. We are looking for two times 10 meg slots. I am here today because, as a police officer, we have one thing in mind. That is not to make a profit; we just want to add to the safety and security of our nation.
>
> The fact is that if we are going to have a look at either dealing with an allocation in the [800 and 900] meg area, should that be the decision that is made by government, or, alternatively, buying service, it is going to cost us—and cost us significantly as we become more reliant on this type of technology. If there was some means by which we can be helped as a profession to transition through into the [800 and 900] megahertz area and, if the allocation was made perhaps there is some means by which we can

---

49 Mr Mark Burgess, Chief Executive Officer, Police Federation of Australia (PFA), *Proof Committee Hansard*, 8 August 2011, p. 8; Mr Andrew Scipione, Board Member, ANZPAA, *Proof Committee Hansard*, 9 August 2011, p. 7.

50 Motorola Solutions, *Supplementary Submission 10*, p. 8.

51 Mr Peter Barrie, Advisor, ANZPAA, *Proof Committee Hansard*, 9 August 2011, p. 8 and Mr Mark Burgess, Chief Executive Officer, PFA, *Proof Committee Hansard*, 8 August 2011, p. 9.

> take some assistance from the Commonwealth to make it, if you like, more achievable.[52]

2.45 In response to the PFA and ANZPAA's claims, the ACMA suggested the use of 800 and 900 MHz spectrum for broadband PPDR radiocommunications would result in lower equipment costs because use of this spectrum for PPDR radiocommunications would be harmonised within the Asia Pacific region:

> ...where we see the growth and the ability for a range of suppliers and equipment is in the fact that these bands will be internationally harmonised for the next generation of mobile technology. We feel that that would provide some great economies of scale for public safety agencies—still with the requirements they have for hardening, which is normally network hardening rather than standards for the handsets—so we do not see that that would be an area that is problematic.[53]

2.46 And:

> We are in region 3, which is the Asia-Pacific and, really, we are looking to standardise probably with China, India, Japan and Korea—countries like those which are large manufacturing countries—so that there is an economy of scale to buy equipment. That is happening in both the 700 and those portions of the 800 that are not yet allocated. Interestingly, those portions of the 800 that we are talking about are immediately adjacent to that Telstra-Voda Next G band and so we would expect those standards just to grow into that band, just as we would expect new standards to come in for the 700 band as well.[54]

Committee view

2.47 As technology advances and the ability to use mobile broadband to inform and support the work of ESOs expands, ESOs' need for broadband spectrum will inevitably increase. In particular, the use of photos, video, maps and other tools will increasingly be relied upon in operational decision-making by ESOs by providing information both to and from "the scene" in real time.

2.48 The committee acknowledges that the capacity for ESOs to use mobile broadband in these ways will better enable ESOs to protect people and property during times of emergency. It is also the committee's view it is preferable to allocate to ESOs dedicated spectrum that is separate from the commercial networks. On this basis, the committee believes that dedicated broadband spectrum should be allocated for PPDR radiocommunications in Australia.

---

52 Mr Andrew Scipione, Board Member, ANZPAA, *Proof Committee Hansard*, 9 August 2011, p. 10.

53 Ms Maureen Cahill, General Manager, Communications Infrastructure Division, ACMA, *Proof Committee Hansard*, 9 August 2011, p. 38.

54 Dr Andrew Kerans, Executive Manager, Spectrum Infrastructure Branch, ACMA, *Proof Committee Hansard*, 9 August 2011, p. 37.

2.49 Further, it is the committee's view that the allocation of broadband spectrum for PPDR radiocommunications should provide for interoperability amongst Australian ESOs and with ESO counterparts overseas.

Recommendation 2

2.50 The committee recommends the Commonwealth Government allocate sufficient spectrum for dedicated broadband public protection and disaster relief (PPDR) radiocommunications in Australia.

2.51 The committee further recommends that any allocation of broadband spectrum to emergency service organisations (ESOs) for PPDR must be provided on the basis of interoperability amongst Australian ESOs and with ESO counterparts overseas.

2.52 However, 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 DBCDE, the ACMA and the Attorney-General's Department are currently engaged in processes examining this question.

2.53 The committee strongly encourages stakeholders participating in the Public Safety Mobile Broadband Steering Committee and the ACMA's review of the 900 MHz band to critically examine the benefits and weaknesses of using spectrum in the 800 and 900 MHz bands for broadband PPDR radiocommunications in Australia. The Commonwealth Government together with state and territory governments should, in collaboration with ESOs, develop strategies to address any identified weaknesses associated with the use of the 800 and 900 MHz bands for broadband PPDR prior to implementing a decision to use this spectrum for this purpose.

2.54 Further, the committee notes the concerns raised by some submitters regarding the availability and cost of equipment for use in 800 and 900 MHz spectrum. The committee suggests that the availability and cost of equipment for use by ESOs is explicitly considered by the Public Safety Mobile Broadband Steering Committee as part of its deliberations.