



# Parliamentary Joint Committee on Law Enforcement

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Spectrum for public safety  
mobile broadband

July 2013

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# LIST OF ACRONYMS AND ABBREVIATIONS

ACMA	Australian Communications and Media Authority
AFP	Australian Federal Police
AGD	Attorney-General's Department
ANZPAA	Australia New Zealand Policing Advisory Service
APT	Asia-Pacific Telecommunity
COAG	Council of Australian Governments
COW	Cell on wheels
DBCDE	Department of Broadband, Communications and the Digital Economy
ESO	Emergency service organisation
4G	Fourth-generation
GHz	Gigahertz
ITU	International Telecommunications Union
LESRSC	Law Enforcement and Security Radio Spectrum Committee
LTE	Long Term Evolution
MHz	Megahertz
NCCGR	National Coordination Committee for Government Radiocommunications
PFA	Police Federation of Australia
PPDR	Public protection and disaster relief
PSA	Public safety agency
PSMB	Public Safety Mobile Broadband
PSMBSC	Public Safety Mobile Broadband Steering Committee
SCPEM	Standing Council on Police and Emergency Management

Telco	Telecommunications company
the committee	Parliamentary Joint Committee on Law Enforcement
3G	Third-generation
3GPP	Third Generation Partnership Project
UHF	Ultra-high frequency
VHF	Very high frequency
WA	Western Australia



# RECOMMENDATIONS

## Recommendation 1

**5.39** The committee recommends that the Minister for Broadband, Communications and the Digital Economy issue a Ministerial Direction to the Australian Communications and Media Authority to allocate 20 MHz of contiguous spectrum in the 700 MHz band for the purposes of a public safety mobile broadband network.

## Recommendation 2

**5.40** The committee recommends that the Minister for Broadband, Communications and the Digital Economy take appropriate measures to secure, for public service agencies, priority access to an additional 10 MHz of spectrum in the 700 MHz band for public safety purposes.

## Recommendation 3

**5.41** If recommendation 1 is not supported by the Australian Government, the committee recommends that the Minister for Broadband, Communications and the Digital Economy issue a Ministerial Direction to the Australian Communications and Media Authority to allocate as a minimum requirement, 20 MHz in the 800 MHz band for the purposes of a public safety mobile broadband network.

## Recommendation 4

**6.45** The committee recommends that the Attorney-General's Department facilitate a public consultation process on a regulatory framework for overflow arrangements between public safety agencies and commercial carriers.

## Recommendation 5

**7.10** The committee recommends that the Australian Government direct an appropriate portion of the proceeds derived from the auction of spectrum to fund the allocation of 20 MHz of spectrum in the 700 MHz band for the purposes of a national public safety mobile broadband network.



# CHAPTER 1

## Introduction

### Conduct of the inquiry

1.1 On 28 May 2013, the Parliamentary Joint Committee on Law Enforcement (the committee) self-referred an inquiry into spectrum for public safety mobile broadband. The terms of reference are as follows:

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

1.2 The committee advertised the inquiry in *The Australian* and on the internet. The committee also invited submissions from interested organisations, individuals and government bodies. The committee received 17 public submissions and one confidential submission. A list of organisations that made public submissions to the inquiry, together with other information authorised for publication, is provided at Appendix 1.

1.3 The committee held public hearings in Canberra on 17 and 24 June 2013. The witnesses who appeared before the committee are listed in Appendix 2.

### Role of public safety agencies

1.4 Australia's public safety agencies (law enforcement, fire, ambulance and emergency services) are critical to the safety and security of the community. Public safety and security agencies are responsible for enforcing the law, responding to accidents and emergencies, providing protection to leaders and heads of government, as well as performing the day-to-day activities that protect the public against threats to life, health and property. To this end, the role of law enforcement agencies is focused on the pursuit of a safe and secure environment.

1.5 In its 2013 report on government services, the Productivity Commission provided the following overview of the role of the police services as public safety agencies:

Police services are the principal means through which State and Territory governments pursue the achievement of a safe and secure environment for the community. This is through the investigation of criminal offences, response to life threatening situations, provision of services to the judicial process and provision of road safety and traffic management. Police services also respond to more general needs in the community—for example, working with emergency management organisations and a wide range of government services and community groups, and advising on general policing and crime issues. Additionally, police are involved in various activities which aim to improve public safety and prevent crime.<sup>1</sup>

### **Historical overview**

1.6 Radio networks are recognised as a fundamental component of public safety operations.<sup>2</sup> However, over a number of decades, successive reports and inquiries following natural disasters and other emergencies have highlighted the need to address a number of factors including shortcomings in emergency communications systems as well as a need for greater interoperability across Australian jurisdictions. Such reports have emphasised the growing frequency of natural disasters and other emergencies which demand an inter-jurisdictional response as well as community expectations regarding the effectiveness of emergency services to protect lives and property. Radiocommunications interoperability refers to the ability of public safety agencies (PSAs) to share voice and data communications between agencies and across jurisdictions.

1.7 After Cyclone Tracy in 1974, when emergency services from all over Australia went to Darwin to assist in the aftermath of the cyclone, it became apparent that Australia needed dedicated radio frequencies to ensure interoperability for police and emergency services.<sup>3</sup> Sixty-four channels were allocated for this purpose, otherwise known as the '64 Channel Block' or more recently the Law Enforcement and

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- 1 Productivity Commission, *Report on Government Services 2013*, 31 January 2013, p. 6.2, [http://www.pc.gov.au/data/assets/pdf\\_file/0006/121767/09-government-services-2013-chapter6.pdf](http://www.pc.gov.au/data/assets/pdf_file/0006/121767/09-government-services-2013-chapter6.pdf) (accessed 8 July 2013).
  - 2 The Hon Nicola Roxon MP and Senator the Hon Stephen Conroy, Spectrum for public Safety Agencies, *Joint Media Release*, 29 October 2012, [http://www.minister.dbcde.gov.au/media/media\\_releases/2012/169](http://www.minister.dbcde.gov.au/media/media_releases/2012/169) (accessed 29 May 2013); Australian Communications and Media Authority, The ACMA to deliver a multi-layered spectrum solution to support public safety mobile broadband capability, *ACMA media release 81/2012–29 October*, [http://www.acma.gov.au/WEB/STANDARD/pc=PC\\_600087](http://www.acma.gov.au/WEB/STANDARD/pc=PC_600087) (accessed 28 May 2013).
  - 3 National Coordinating Committee for Government Radiocommunications, *An Introduction*, 2011, p. 2, <http://nccgr.govspace.gov.au/files/2012/02/NCCGR-A5-Booklet-2011-Strategic-Directions.pdf> (accessed 6 June 2013).

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Public Safety Spectrum.<sup>4</sup> However, over time, the availability of the channels for emergency services was not maintained.<sup>5</sup>

1.8 According to the National Coordinating Committee for Government Radiocommunications (NCCGR) which is tasked with improving government radiocommunications interoperability, low levels of interoperability have hampered the response of PSAs to emergencies since 1974. Poor interoperability is particularly needed when incidents require an inter-jurisdictional response. The NCCGR recognised that:

...the greatest challenge for the NCCGR to improve government radiocommunications interoperability in Australia is not technically-based; rather it has been the development of a coordinated and collaborative approach to this issue across agencies, within jurisdictions and across Australia.<sup>6</sup>

1.9 The NCCGR asserted that in the 20 years between 1974 and 1994, there were three incidents that required an inter-jurisdictional response and since 1994, there have been at least eight. According to the NCCGR, this trend towards multi-agency and cross-jurisdictional operations is likely to continue given the impact of climate change and continuing threat of terrorism.<sup>7</sup>

1.10 The Sydney Hilton bombing in 1978, which was recognised as the first terrorist attack in Australia, brought into sharp relief the need for interoperable radio spectrum specifically for counter-terrorism response operations under national arrangements.<sup>8</sup> During the 1980s, eleven radio channels were established and allocated in the 480–490 MHz band. However, according to Mr Bob Waites, then Assistant Commissioner of the NSW Police Force, respective governments did not prioritise the need for interoperability when purchasing radio equipment or systems on

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4 Mr Bob Waites, Assistant Commissioner, NSW Police Force, RadComms Conference Melbourne April/May 2008, p. 2, [http://www.acma.gov.au/webwr/\\_assets/main/lib310661/13bobwaites.pdf](http://www.acma.gov.au/webwr/_assets/main/lib310661/13bobwaites.pdf) (accessed 3 June 2013).

5 Council of Australian Governments, *National Inquiry on Bushfire Mitigation and Management*, 31 March 2004, p. 137, [http://www.coagbushfireenquiry.gov.au/report/pdfs/report\\_large\\_size.pdf](http://www.coagbushfireenquiry.gov.au/report/pdfs/report_large_size.pdf) (accessed 3 June 2013).

6 National Coordinating Committee for Government Radiocommunications, Introduction, p. 1, <http://nccgr.govspace.gov.au/files/2012/02/NCCGR-A4-Intro1.pdf> (accessed 10 June 2013).

7 National Coordinating Committee for Government Radiocommunications, *An Introduction*, 2011, p. 2, <http://nccgr.govspace.gov.au/files/2012/02/NCCGR-A5-Booklet-2011-Strategic-Directions.pdf> (accessed 6 June 2013).

8 Spectrum is described as the 'waves' of electric and magnetic energy moving together through space. These waves carry information or communications. Department of Broadband, Communications and the Digital Economy, *Fact sheet 1: Introduction to spectrum management*, December 2012, [http://www.dbcde.gov.au/\\_data/assets/pdf\\_file/0003/139116/Fact-Sheet-1-Dec-2012.pdf](http://www.dbcde.gov.au/_data/assets/pdf_file/0003/139116/Fact-Sheet-1-Dec-2012.pdf) (accessed 7 June 2013).

the basis of an opinion that the 'likelihood for interoperability needs were rare or remote'.<sup>9</sup> As a consequence, they acquired systems that operated outside the designated band.

1.11 In 1991, in an attempt to improve productivity and reduce spectrum congestion, the states and territories commenced reviews of their spectrum use and began to migrate from single-channel radios—which are considered to be inefficient in their use of spectrum—to multi-channel radios.<sup>10</sup> However:

Some jurisdictions chose to operate these new systems in the very high frequency (30–300 megahertz) band; others chose the ultra high frequency (300–3000 megahertz) band. These decisions restricted opportunities for interoperability.<sup>11</sup>

1.12 In 2004, Police Commissioners and Police Ministers established the Law Enforcement and Security Radio Spectrum Committee (LESRSC) with the aim of developing a long-term strategic plan for law enforcement and security radiocommunications.<sup>12</sup> In a submission to the Australian Communications and Media Authority (ACMA) regarding spectrum reform in 2008, the LESRSC identified a number of key issues which needed to be addressed in relation to acquiring and operating radio systems. These included:

...use of dissimilar frequency bands, scarcity of frequency, capacity and coverage constraints, interference issues, interoperability problems, and changing industry standards.<sup>13</sup>

1.13 Following the severe 2002–2003 fire season, a 2005 Council of Australian Governments (COAG) report on Bushfire Mitigation and Management highlighted significant impediments to good communication between public safety agencies. In

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9 Mr Bob Waites, Assistant Commissioner, NSW Police Force, RadComms Conference Melbourne April/May 2008, p. 2, <http://www.acma.gov.au/webwr/assets/main/lib310661/13bobwaites.pdf> (accessed 3 June 2013).

10 Council of Australian Governments, *National Inquiry on Bushfire Mitigation and Management*, 31 March 2004, p. 137, [http://www.coagbushfireenquiry.gov.au/report/pdfs/report\\_large\\_size.pdf](http://www.coagbushfireenquiry.gov.au/report/pdfs/report_large_size.pdf) (accessed 3 June 2013).

11 Council of Australian Governments, *National Inquiry on Bushfire Mitigation and Management*, 31 March 2004, p. 137, [http://www.coagbushfireenquiry.gov.au/report/pdfs/report\\_large\\_size.pdf](http://www.coagbushfireenquiry.gov.au/report/pdfs/report_large_size.pdf) (accessed 3 June 2013).

12 Law Enforcement and Security Radio Spectrum Committee, Comments for Australian Communications and Media Authority, Spectrum Reform Discussion Papers, Version 2, 28 July 2008, p. 3, <http://www.acma.gov.au/webwr/assets/main/lib310714/lesrsc.pdf> (accessed 7 June 2013).

13 Law Enforcement and Security Radio Spectrum Committee, Comments for Australian Communications and Media Authority, Spectrum Reform Discussion Papers, Version 2, 28 July 2008, p. 1, <http://www.acma.gov.au/webwr/assets/main/lib310714/lesrsc.pdf> (accessed 7 June 2013).

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the report, COAG noted its support for the NCCGR's efforts to develop a national strategy to enable interoperability of emergency service radio communication across Australia.<sup>14</sup>

1.14 Between November 2010 and February 2011, Australia experienced a series of natural disasters which saw more than 99 per cent of Queensland disaster-declared while all other states and the Northern Territory experienced severe weather events or other natural disasters including bushfires.<sup>15</sup> In its March 2012 final report, the Queensland Floods Commission of Inquiry noted that the fire, ambulance and police services used stand-alone radio communications networks and did not have interoperable radio communications during the disaster. The Commission found that the 400 MHz spectrum could not be effectively used for data communication because the size of each spectrum allocation was too small to transmit large files. Because of the insufficient spectrum for transmitting large files and/or during times of high demand, the network became congested.<sup>16</sup> The Commission concluded that the allocation of broadband spectrum to Australia's emergency services organisations was 'vital' to avoid congestion on narrowband communications and to assist Australian emergency service organisations in achieving interoperability.<sup>17</sup>

1.15 In November 2011, the Senate Environment and Communications References Committee made six recommendations in relation to communications networks and emergency warning systems including the allocation of sufficient spectrum for dedicated broadband public protection and disaster relief (PPDR) radiocommunications in Australia. The committee further recommended 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.<sup>18</sup> The committee did not have the 'technical expertise' to recommend whether this spectrum should be in the 700 MHz, 800 MHz

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14 Council of Australian Governments, *National Inquiry on Bushfire Mitigation and Management*, 31 March 2004, pp xv and xxvii, [http://www.coagbushfireinquiry.gov.au/report/pdfs/report\\_large\\_size.pdf](http://www.coagbushfireinquiry.gov.au/report/pdfs/report_large_size.pdf) (accessed 3 June 2013).

15 Australian Bureau of Statistics, 'The 2010–11 summer of natural disasters', cat. 1301.10 *Year Book Australia, 2012*, <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/1301.0Main+Features1952012> (accessed 7 June 2013).

16 Queensland Floods Commission of Inquiry, *Final Report*, March 2012, p. 398, [http://www.floodcommission.qld.gov.au/\\_data/assets/pdf\\_file/0007/11698/QFCI-Final-Report-March-2012.pdf](http://www.floodcommission.qld.gov.au/_data/assets/pdf_file/0007/11698/QFCI-Final-Report-March-2012.pdf) (accessed 7 June 2013).

17 Queensland Floods Commission of Inquiry, *Final Report*, March 2012, p. 399, [http://www.floodcommission.qld.gov.au/\\_data/assets/pdf\\_file/0007/11698/QFCI-Final-Report-March-2012.pdf](http://www.floodcommission.qld.gov.au/_data/assets/pdf_file/0007/11698/QFCI-Final-Report-March-2012.pdf) (accessed 7 June 2013).

18 Senate Environment and Communications References Committee, *The capacity of communication networks and emergency warning systems to deal with emergencies and natural disasters*, November 2011, Recommendation 2, p. vii, [http://www.aph.gov.au/Parliamentary\\_Business/Committees/Senate\\_Committees?url=ec\\_ctte/completed\\_inquiries/2010-13/emergency\\_communications/index.htm](http://www.aph.gov.au/Parliamentary_Business/Committees/Senate_Committees?url=ec_ctte/completed_inquiries/2010-13/emergency_communications/index.htm) (accessed 28 May 2013).

or 900 MHz band. It did, however, note the concerns raised by some submitters regarding the availability and cost of equipment for use in the 800 MHz and 900 MHz spectrum bands and suggested that the availability and cost of equipment for use by ESOs be explicitly considered by the Public Safety Mobile Broadband Steering Committee (PSMBSC) as part of its deliberations.<sup>19</sup>

## Reliance on narrowband mobile networks

1.16 Public safety agencies (PSAs) have historically relied on narrowband voice and data communications to support their operations. Narrowband networks were primarily deployed in the 400 MHz band with some systems operating in the very high frequency (VHF) and 800 MHz bands. Currently, the majority of dedicated public safety radiocommunications services in Australia are narrowband mobile networks operating in the VHF and ultra-high frequency (UHF) bands.<sup>20</sup> However, mobile broadband and newer technologies have increasingly been recognised as important information sharing tools to help enhance situational awareness in the field and to maximise operational effectiveness.<sup>21</sup> With stronger networks and greater capabilities, it is possible for PSAs to supplement existing two-way radio voice communications with rich data and video content. These capabilities would provide emergency service responders with the best possible information to best serve and protect the community.<sup>22</sup>

1.17 In 2008, the ACMA instigated an assessment of PSA needs through a wide-ranging review of the 400 MHz band. According to the ACMA, it resulted in an expansion of PSA spectrum resources and a framework for national interoperability.<sup>23</sup> In 2011, growing demand for an interoperable mobile broadband capability for the use of PSAs led the Australian Government to announce the possible 'earmarking' of spectrum from the 800 MHz band for potential use by PSAs to build their mobile broadband capability. The PSMBSC was established to examine how a provision in the 800 MHz band could support a public safety mobile broadband (PSMB)

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19 Senate Environment and Communications References Committee, *The capacity of communication networks and emergency warning systems to deal with emergencies and natural disasters*, November 2011, p. 27.

20 Australian Communications and Media Authority, *Spectrum for public safety radiocommunications, Current ACMA initiatives and decisions*, October 2012, p. 9, [http://www.acma.gov.au/webwr/radcomm/frequency\\_planning/radiofrequency\\_planning\\_topics/docs/spectrum\\_for\\_public\\_safety.pdf](http://www.acma.gov.au/webwr/radcomm/frequency_planning/radiofrequency_planning_topics/docs/spectrum_for_public_safety.pdf) (accessed 29 May 2013).

21 Motorola Solutions, *Submission 10*, p. [1].

22 Motorola Solutions, *Submission 10*, p. [2].

23 Australian Communications and Media Authority, The ACMA to deliver a multi-layered spectrum solution to support public safety mobile broadband capability, *Media release*, 81/2012, 29 October 2012, <http://www.acma.gov.au/theACMA/the-acma-to-deliver-a-multi-layered-spectrum-solution> (accessed 29 May 2013).



capability.<sup>24</sup> The migration of Australia's television broadcasting systems from analogue to digital technology presented a rare opportunity for the allocation of valuable spectrum.<sup>25</sup>

### **Spectrum as a scarce and valuable public resource**

1.18 Spectrum is used to send electromagnetic signals through space. It carries signals used for radio, television, mobile phones, mobile broadband, scientific research, defence activities, public safety and other personal communication systems.<sup>26</sup>

1.19 In 2012, the Minister for Broadband, Communications and the Digital Economy recognised spectrum as a 'national resource that needs to be managed in the public interest' and as a 'valuable public asset'.<sup>27</sup> Many witnesses to the inquiry similarly recognised spectrum as an important scarce public resource.<sup>28</sup> According to the ACMA, as spectrum is a 'scarce natural resource', the public benefit from its allocation must be optimised.<sup>29</sup> The ACMA also recognised spectrum as an increasingly important factor of production for the Australian economy.<sup>30</sup>

1.20 The Police Federation of Australia (PFA), noted that spectrum is a 'finite and scarce resource, wholly-owned by the Commonwealth Government'.<sup>31</sup> The Western Australian (WA) Government recognised spectrum as a 'resource that belongs to the citizens of Australia'.<sup>32</sup> The WA Government argued that the jurisdictions expect that

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- 24 Australian Communications and Media Authority, *Spectrum for public safety radiocommunications, Current ACMA initiatives and decisions*, October 2012, p. 1, [http://www.acma.gov.au/webwr/radcomm/frequency\\_planning/radiofrequency\\_planning\\_topics/docs/spectrum\\_for\\_public\\_safety.pdf](http://www.acma.gov.au/webwr/radcomm/frequency_planning/radiofrequency_planning_topics/docs/spectrum_for_public_safety.pdf) (accessed 29 May 2013); The Hon Robert McClelland MP and Senator the Hon Stephen Conroy, Discussions on national broadband for public and emergency services, *Joint Media Release*, 10 May 2011, [http://www.minister.dbcde.gov.au/media/media\\_releases/2011/177](http://www.minister.dbcde.gov.au/media/media_releases/2011/177) (accessed 28 May 2013).
- 25 Motorola Solutions, *Submission 10*, p. [2].
- 26 Department of Broadband, Communications and the Digital Economy, What is 'spectrum?', <http://s2.dbcde.gov.au/what-is-spectrum/> (accessed 16 July 2013).
- 27 Minister for Broadband, Communications and the Digital Economy, Senator the Hon Stephen Conroy, Renewal decision provides certainty for mobile customers, *Media Release*, 10 February 2012, [http://www.minister.dbcde.gov.au/media/media\\_releases/2012/015](http://www.minister.dbcde.gov.au/media/media_releases/2012/015) (accessed 19 June 2013); Minister for Broadband, Communications and the Digital Economy, Senator the Hon Stephen Conroy, Government provides certainty for digital dividend auction, *Media Release*, 14 December 2012, [http://www.minister.dbcde.gov.au/media/media\\_releases/2012/204](http://www.minister.dbcde.gov.au/media/media_releases/2012/204) (accessed 19 June 2013).
- 28 The Australian Mobile Telecommunications Association (AMTA) also viewed spectrum as an 'important national resource'. AMTA, *Submission 6*, p. 6.
- 29 Mr Chris Cheah, ACMA, *Committee Hansard*, 24 June 2013, p. 7; ACMA, *Submission 7*, p. [1].
- 30 Mr Chris Cheah, ACMA, *Committee Hansard*, 24 June 2013, p. 7.
- 31 Police Federation of Australia, *Submission 2*, p. 14.
- 32 Western Australian Government, *Submission 4*, p. 2.

the Commonwealth will make spectrum available at no cost to the states and territories as a national PSMB network will 'produce a significant public safety benefit for the people of Australia'.<sup>33</sup>

### **Legislative and policy framework**

1.21 The legislative framework for the management of radiofrequency spectrum in Australia, including spectrum plans and frequency band plans, spectrum licencing and apparatus licences, is provided by the *Radiocommunications Act 1992* (Radiocommunications Act).

1.22 The objective of the Radiocommunications Act is to provide for management of the radiofrequency spectrum in order to:

- (a) maximise, by ensuring the efficient allocation and use of the spectrum, the overall public benefit derived from using the radiofrequency spectrum;
- (b) *make adequate provision of the spectrum:*
  - (i) *for use by agencies involved in the defence or national security of Australia, law enforcement or the provision of emergency services; and*
  - (ii) *for use by other public or community services;*
- (c) provide a responsive and flexible approach to meeting the needs of users of the spectrum;
- (d) encourage the use of efficient radiocommunications technologies so that a wide range of services of an adequate quality can be provided;
- (e) provide an efficient, equitable and transparent system of charging for the use of spectrum, taking account of the value of both commercial and non-commercial use of spectrum;
- (f) support the communications policy objectives of the Commonwealth Government;
- (g) provide a regulatory environment that maximises opportunities for the Australian communications industry in domestic and international markets;
- (h) promote Australia's interests concerning international agreements, treaties and conventions relating to radiocommunications or the radiofrequency spectrum.<sup>34</sup> (emphasis added)

1.23 Section 9 of the *Australian Communications and Media Authority Act 2005* (ACMA Act) sets out the spectrum management functions of the ACMA. The ACMA is responsible for the regulation of broadcasting, the internet, radiocommunications and telecommunications. It has statutory responsibility for issuing licences for spectrum use and determining relevant charges.<sup>35</sup> The role of the ACMA in relation to

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33 Western Australian Government, *Submission 4*, p. 2.

34 *Radiocommunications Act 1992*, s. 3.

35 Department of Broadband, Communications and the Digital Economy, Fact sheet 2: Public safety mobile broadband capability—process overview, December 2012.

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spectrum was described by Mr Chris Cheah, Authority Member of the ACMA who noted that a key ACMA statutory function is to 'manage the spectrum resource of Australia independently and in the public interest'.<sup>36</sup>

1.24 The ACMA Act requires that the ACMA manage the radiofrequency spectrum in accordance with the Radiocommunications Act, as well as to advise and assist the radiocommunications community. In March 2009, the ACMA released its *Principles for spectrum management* to guide its decision making on spectrum management. The principles are:

1. Allocate spectrum to the highest value use or uses.
2. Enable and encourage spectrum to move to its highest value use or uses.
3. Use the least cost and least restrictive approach to achieving policy objectives.
4. To the extent possible, promote both certainty and flexibility.
5. Balance the cost of interference and the benefits of greater spectrum utilisation.<sup>37</sup>

### **Acknowledgement**

1.25 The committee thanks the organisations and individuals who made submissions and gave evidence at the public hearings.

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36 Mr Chris Cheah, ACMA, *Committee Hansard*, 24 June 2013, p. 7.

37 Australian Communications and Media Authority, *Principles for spectrum management*, March 2009, [http://www.acma.gov.au/webwr/assets/main/lib310828/principles\\_for\\_spectrum\\_management.pdf](http://www.acma.gov.au/webwr/assets/main/lib310828/principles_for_spectrum_management.pdf) (accessed 30 May 2013).



## CHAPTER 2

### Announcements and the decision making process

2.1 This chapter details the announcements regarding spectrum for public safety mobile broadband. It considers the consultation and decision making processes which informed the reservation of spectrum to public safety agencies while the following chapters considers the debates and viewpoints of stakeholders in relation to these decisions.

#### Council of Australian Governments

2.2 In December 2009, COAG endorsed the National Framework to Improve Government Radiocommunications Interoperability (Framework) for law enforcement and emergency services.<sup>1</sup> Produced by the Natural Disaster Arrangements Working Group in collaboration with the NCCGR, the Framework provides a set of guiding principles and identifies key areas of work to enhance government voice and data radiocommunications interoperability by 2020. Specifically, it aims to achieve a transition of all domestic radiocommunications equipment to interoperable systems, modes and frequencies over a ten-year period from 2010.<sup>2</sup>

2.3 According to the NCCGR, improvements to interoperability arising from the Framework will enable government radiocommunications users to:

- more effectively use their own equipment across jurisdictions thereby enhancing cross-jurisdictional operations and rapid deployment of emergency service personnel;
- improve response to routine public safety incidents such as building fires that may require support from several agencies within a jurisdiction, or during police vehicle pursuits that may necessitate cross-jurisdictional assistance if state borders are crossed;
- seamlessly switch from 'day-to-day' communications to multi-agency and/or cross-jurisdictional communications which are often deployed during emergencies such as natural disasters, catastrophic accidents, large scale incidents, and similar events that may occur without much warning; and

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1 Natural Disaster Arrangements Working Group, *National Framework to Improve Government Radiocommunications Interoperability. Towards a harmonised radiocommunications environment for public protection and disaster relief 2010–2020*, p. 1, <http://www.em.gov.au/Fundinginitiatives/NationalEmergencyManagementProjects/NationalEmergencyManagementProjects20102011/Pages/ImplementationofNationalInteroperabilityFrameworkBriefings.aspx> (accessed 31 May 2013).

2 Natural Disaster Arrangements Working Group, *National Framework to Improve Government Radiocommunications Interoperability. Towards a harmonised radiocommunications environment for public protection and disaster relief 2010–2020*, p. 5.

- exploit new and emerging technologies that support improved interoperability as a result of a nationally consistent coordinated approach.<sup>3</sup>

2.4 In 2011, COAG endorsed the National Strategy for Disaster Resilience (NSDR) to encapsulate a new resilience-based approach to emergency management. As part of the implementation of the NSDR, a range of initiatives were identified to 'enhance Australia's capacity to withstand and recover from emergencies and natural disasters'. The development of an implementation plan for national public safety mobile broadband (PSMB) capability, to enable emergency services such as police, fire fighters and ambulance to communicate and share information while on the move, was one of the identified initiatives.<sup>4</sup>

2.5 The COAG Standing Council on Police and Emergency Management (SCPEM) is responsible for promoting a coordinated national response to law enforcement and emergency management issues.<sup>5</sup>

### **Australian Communications and Media Authority reservation of 10 MHz**

2.6 In May 2011, the Australian Government announced the possible 'earmarking' of spectrum from the 800 MHz band for potential use by PSAs to build their mobile broadband capability.<sup>6</sup> Then on 29 October 2012, the ACMA announced the allocation of spectrum for a nationally interoperable PSMB capability. Following analysis conducted in conjunction with PSAs through the PSMBSC, the ACMA announced that it would take a multi-layered approach to the provision of spectrum for PSAs on the basis that there is no single-band solution able to meet all the mobile communication requirements of PSAs. The two measures announced on 29 October build on arrangements to expand capability in the 400 MHz band which has been identified for the exclusive use of government, primarily to support national security, law enforcement and emergency services.<sup>7</sup> The two measures included:

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3 National Coordinating Committee for Government Radiocommunications, An Introduction, p. 5, <http://nccgr.govspace.gov.au/files/2012/02/NCCGR-A4-Intro1.pdf> (accessed 31 May 2013).

4 Council of Australian Governments, *National Security and Community Safety*, [http://www.coag.gov.au/national\\_security\\_and\\_community\\_safety](http://www.coag.gov.au/national_security_and_community_safety) (accessed 31 May 2013).

5 Standing Council on Police and Emergency Management, Terms of Reference, <http://www.ag.gov.au/EmergencyManagement/Documents/SCPEMtermsofreference.pdf> (accessed 31 May 2013).

6 The Hon Robert McClelland MP and Senator the Hon Stephen Conroy, Discussions on national broadband for public and emergency services, *Joint Media Release*, 10 May 2011, [http://www.minister.dbcde.gov.au/media/media\\_releases/2011/177](http://www.minister.dbcde.gov.au/media/media_releases/2011/177) (accessed 28 May 2013).

7 Australian Communications and Media Authority, *Spectrum for public safety radiocommunications, Current ACMA initiatives and decisions*, October 2012, p. 2, [http://www.acma.gov.au/webwr/radcomm/frequency\\_planning/radiofrequency\\_planning\\_topics/docs/spectrum\\_for\\_public\\_safety.pdf](http://www.acma.gov.au/webwr/radcomm/frequency_planning/radiofrequency_planning_topics/docs/spectrum_for_public_safety.pdf) (accessed 29 May 2013); Australian Communications and Media Authority, *Spectrum for public safety radiocommunications*, 29 October 2012, [http://www.acma.gov.au/WEB/STANDARD/pc=PC\\_600085](http://www.acma.gov.au/WEB/STANDARD/pc=PC_600085) (accessed 28 May 2013).

- 10 MHz of spectrum in the 800 MHz band as a 2 x 5 MHz paired assignment; and
- 50 MHz of spectrum from the 4.9 gigahertz (GHz) frequency band.<sup>8</sup>

2.7 The ACMA noted that the provision of 10 MHz of spectrum from the 800 MHz and 50 MHz in the 4.9 GHz bands would facilitate the deployment of 'high-speed, nationally interoperable mobile broadband networks by public safety agencies'.<sup>9</sup> The ACMA's Chairman, Mr Chris Chapman stated that:

The measures announced today will meet two specific needs identified by Australia's public safety agencies—the need for wide-ranging 4G coverage, together with very high capacity, short range coverage for specific incidents and in high demand areas.<sup>10</sup>

2.8 The allocations and the multi-layered approach announced on 29 October 2012 are detailed in the following section.

### ***10 MHz spectrum from the 800 MHz band***

2.9 The ACMA announced that 10 MHz of spectrum (2 x 5 MHz) from the 800 MHz band would be provided for a PSMB cellular 4G data capability. This band supports 4G (LTE) systems and technologies which is a standard for wireless communication of high-speed data for mobile phones and data terminals. For this reason, it is considered to be 'beach front' spectrum by carriers and PSAs alike.<sup>11</sup>

2.10 The Department of Broadband, Communications and the Digital Economy (DBCDE) noted in December 2012 that the frequency range proposed to be earmarked for allocation to PSMB was a portion of the 805–820 MHz paired with a portion from 850–870 MHz.<sup>12</sup> The 805–820 MHz portion band will be freed up result of the switchover from analogue to digital television transmission. The allocation of

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8 Australian Communications and Media Authority, The ACMA to deliver a multi-layered spectrum solution to support public safety mobile broadband capability, *ACMA media release* 81/2012 – 29 October 2012, <http://www.acma.gov.au/theACMA/the-acma-to-deliver-a-multi-layered-spectrum-solution> (accessed 29 May 2013); ACMA,

9 Australian Communications and Media Authority, Spectrum for public safety radiocommunications, *Media Release*, 29 October 2012, [http://www.acma.gov.au/WEB/STANDARD/pc=PC\\_600087](http://www.acma.gov.au/WEB/STANDARD/pc=PC_600087) (accessed 28 May 2013).

10 Australian Communications and Media Authority, Spectrum for public safety radiocommunications, *Media Release*, 29 October 2012, [http://www.acma.gov.au/WEB/STANDARD/pc=PC\\_600087](http://www.acma.gov.au/WEB/STANDARD/pc=PC_600087) (accessed 28 May 2013).

11 Australian Communications and Media Authority, *Spectrum for public safety radiocommunications, Current ACMA initiatives and decisions*, October 2012, p. 2, [http://www.acma.gov.au/webwr/radcomm/frequency\\_planning/radiofrequency\\_planning\\_topics/docs/spectrum\\_for\\_public\\_safety.pdf](http://www.acma.gov.au/webwr/radcomm/frequency_planning/radiofrequency_planning_topics/docs/spectrum_for_public_safety.pdf) (accessed 29 May 2013).

12 Department of Broadband, Communications and the Digital Economy, *Fact sheet 3: Public safety mobile broadband capability 700 MHz v 800 MHz—Suitability for Australian public safety use*, December 2012, [http://www.dbcde.gov.au/broadband/public\\_safety\\_mobile\\_broadband\\_steering\\_committee](http://www.dbcde.gov.au/broadband/public_safety_mobile_broadband_steering_committee) (accessed 7 June 2013).



spectrum from the 800 MHz band for PSAs is expected to be made available in 2015 at the same time as spectrum in the 700 MHz band.<sup>13</sup>

2.11 The precise frequencies to be provided from within the 800 MHz band will be determined in the context of the ACMA's full review of the 803–960 MHz band. The review of the 803–960 MHz band commenced in May 2011 and two discussion papers were released by the ACMA as part of a consultation process. The first paper was released in May 2011.<sup>14</sup> The second discussion paper was released in December 2012 with the consultation process on the discussion paper closing in February 2013.<sup>15</sup>

### ***Provision of 50 MHz spectrum in the 4.9 GHz band***

2.12 The ACMA also announced the provision of 50 MHz of spectrum from the 4.9 GHz band (4940–4990 MHz frequency range) for PSAs. According to the ACMA, this spectrum is recognised internationally as a public protection and disaster relief band by the International Telecommunication Union.<sup>16</sup>

2.13 The ACMA stated that the 4.9 GHz band is capable of extremely high capacity, short range, deployable data and video communications (including supplementary capacity for the PSMB network in areas of very high demand).<sup>17</sup> It is intended that this will support applications such as WiFi-based local area networks (LANs), sensor (including video) linking and data offload to absorb high localised capacity demand in a PSMB network.<sup>18</sup> The ACMA considered this to be one way in which the 50 MHz from the 4.9 GHz band would be useful in providing a

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13 Department of Broadband, Communications and the Digital Economy, *Fact sheet 2: Public safety mobile broadband capability—process overview*, December 2012, [http://www.dbcde.gov.au/broadband/public\\_safety\\_mobile\\_broadband\\_steering\\_committee](http://www.dbcde.gov.au/broadband/public_safety_mobile_broadband_steering_committee) (accessed 7 June 2013).

14 A separate consultation was undertaken in relation to expiring licences. ACMA, *Expiring spectrum licences—technical framework for the 800 MHz band*, June 2012.

15 Australian Communications and Media Authority, *Review of the 803–960 MHz Band*, [http://165.191.2.20/WEB/STANDARD/pc=PC\\_312463](http://165.191.2.20/WEB/STANDARD/pc=PC_312463) (accessed 6 June 2013); Australian Communications and Media Authority, *The 803–960 MHz band—exploring options for future change*, IFC 47/2012, March 2013, [http://165.191.2.20/WEB/STANDARD/pc=PC\\_600124](http://165.191.2.20/WEB/STANDARD/pc=PC_600124) (accessed 6 June 2013).

16 Australian Communications and Media Authority, *Spectrum for public safety radiocommunications, Current ACMA initiatives and decisions*, October 2012, p. 2, [http://www.acma.gov.au/webwr/radcomm/frequency\\_planning/radiofrequency\\_planning\\_topics/docs/spectrum\\_for\\_public\\_safety.pdf](http://www.acma.gov.au/webwr/radcomm/frequency_planning/radiofrequency_planning_topics/docs/spectrum_for_public_safety.pdf) (accessed 29 May 2013).

17 Australian Communications and Media Authority, 'The ACMA to deliver a multi-layered spectrum solution to support public safety mobile broadband capability', *Media Release*, 81/2012 – 29 October 2012, <http://www.acma.gov.au/theACMA/the-acma-to-deliver-a-multi-layered-spectrum-solution> (accessed 5 June 2013).

18 Australian Communications and Media Authority, *The 803–960 MHz band—exploring options for future change*, Discussion paper, December 2012, p. 42, [http://www.acma.gov.au/webwr/assets/main/lib550052/ifc47\\_2012-803-960mhz\\_band.pdf](http://www.acma.gov.au/webwr/assets/main/lib550052/ifc47_2012-803-960mhz_band.pdf) (accessed 6 June 2013).



supplementary, localised capability where and when it is needed.<sup>19</sup> It stated that the 4.9 GHz spectrum could be used, therefore, to provide spill-over capacity where major events cause a spike in traffic.<sup>20</sup>

2.14 Under the ACMA proposal, a class licencing arrangement would be applied in the 4.9 GHz band to allow PSAs to use the band on a non-exclusive basis without the need for individual device licences. According to the ACMA, a class licencing arrangement would provide significant flexibility in deployment during emergency response and disaster recovery activities. It would also allow PSAs to access spectrum to facilitate their activities without administrative overheads.<sup>21</sup>

### ***Multi-layered approach***

2.15 The ACMA Chairman, Mr Chris Chapman asserted that the complementary combination of spectrum in the different bands will provide PSAs with an opportunity and effective outcome as it will provide both 'coverage and penetration'. He noted that the allocation of spectrum:

...provides PSAs in Australia with an extraordinary opportunity to do great things in the public interest with spectrum that provides coverage, flexibility, scalability... it'll drive interoperability, it gives them capacity for data, video and voice. And it's within a harmonised framework.<sup>22</sup>

2.16 The ACMA has also noted that the intention is to ensure that the PSMB network will be available within a wide coverage area and, where there is no coverage, responders' devices will be able to connect to commercial mobile

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- 19 Australian Communications and Media Authority, *Spectrum for public safety radiocommunications, current ACMA initiatives and decisions*, October 2012, p. 12, [http://www.acma.gov.au/webwr/radcomm/frequency\\_planning/radiofrequency\\_planning\\_topics/docs/spectrum\\_for\\_public\\_safety.pdf](http://www.acma.gov.au/webwr/radcomm/frequency_planning/radiofrequency_planning_topics/docs/spectrum_for_public_safety.pdf) (accessed 29 May 2013).
- 20 Australian Communications and Media Authority, *The 803–960 MHz band—exploring options for future change*, Discussion paper, December 2012, p. 43, [http://www.acma.gov.au/webwr/assets/main/lib550052/ifc47\\_2012-803-960mhz\\_band.pdf](http://www.acma.gov.au/webwr/assets/main/lib550052/ifc47_2012-803-960mhz_band.pdf) (accessed 6 June 2013).
- 21 Australian Communications and Media Authority, *Proposed class licence in the 4.9 GHz band for public safety agencies*, Consultation Paper, October 2012, p. 2, [http://www.acma.gov.au/webwr/assets/main/lib550039/ifc43-2012-public\\_safety-use-4.9ghz\\_band.pdf](http://www.acma.gov.au/webwr/assets/main/lib550039/ifc43-2012-public_safety-use-4.9ghz_band.pdf) (accessed 6 June 2013); 'Proposed class licence in 4.9 GHz band: public safety agencies, Issue for comment 43/2012, <http://www.acma.gov.au/theACMA/Consultations/Consultations/Current/submissions-to-proposed-class-licence-in-4-9-ghz-band---public-safety-agencies> (accessed 6 June 2013).
- 22 Mr Chris Chapman, ACMA, 'ACMA chair: 60 MHz emergency services spectrum package "almost unique" globally', *Communications Day*, 29 October 2012, <http://www.commsday.com/latest-news/acma-chair-60mhz-emergency-services-%E2%80%A8spectrum-package-almost-unique-globally> (accessed 5 June 2013).

networks.<sup>23</sup> Coverage in relation to the three layers of the model were described as follows:

- Wide-area narrowband voice and data using land-mobile topology, predominantly employing the 400 MHz band in Australia.
- Wide-area broadband data using cellular topology (PSMB), potentially using the 800 MHz band and supported by business agreements with commercial carriers in Australia, with supplementary, on-demand coverage and capacity provided by additional deployable base stations.
- Short-range high-capacity data in deployable hotspots, using the 4.9 GHz band in Australia. While propagation distances in the 4.9 GHz band are much shorter than in the 400 and 800 MHz bands, there is much more spectrum available (50 MHz) for public safety use.<sup>24</sup>

### **Spectrum offer to public safety agencies**

2.17 On the same day as the ACMA announcement of 29 October 2012, the Attorney-General, the Hon Nicola Roxon MP, and the Minister for Broadband, Communications and the Digital Economy, Senator the Hon Stephen Conroy affirmed that the ACMA spectrum allocations for a PSMB network followed a request by the Australian Government to the ACMA for dedicated emergency services spectrum.<sup>25</sup>

2.18 The ministerial joint media release further noted that:

The government's offer to the states of the spectrum will be at a negotiated price and conditional on a number of factors, including:

- the capability being nationally interoperable;
- the States and Territories funding all costs associated with designing, building, equipping, maintaining and operating the capability; and
- an agreement to provide reasonable access to State and Territory networks by relevant Commonwealth agencies.<sup>26</sup>

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23 Australian Communications and Media Authority, *The 803–960 MHz band—exploring options for future change*, Discussion paper, December 2012, p. 42, [http://www.acma.gov.au/webwr/assets/main/lib550052/ifc47\\_2012-803-960mhz\\_band.pdf](http://www.acma.gov.au/webwr/assets/main/lib550052/ifc47_2012-803-960mhz_band.pdf) (accessed 6 June 2013).

24 Australian Communications and Media Authority, *The 803–960 MHz band—exploring options for future change*, Discussion paper, December 2012, p. 43, [http://www.acma.gov.au/webwr/assets/main/lib550052/ifc47\\_2012-803-960mhz\\_band.pdf](http://www.acma.gov.au/webwr/assets/main/lib550052/ifc47_2012-803-960mhz_band.pdf) (accessed 6 June 2013).

25 The Hon Nicola Roxon MP and Senator the Hon Stephen Conroy, Spectrum for public Safety Agencies, *Joint Media Release*, 29 October 2012, [http://www.minister.dbcde.gov.au/media/media\\_releases/2012/169](http://www.minister.dbcde.gov.au/media/media_releases/2012/169) (accessed 29 May 2013).

26 The Hon Nicola Roxon MP and Senator the Hon Stephen Conroy, Spectrum for public Safety Agencies, *Joint Media Release*, 29 October 2012, [http://www.minister.dbcde.gov.au/media/media\\_releases/2012/169](http://www.minister.dbcde.gov.au/media/media_releases/2012/169) (accessed 29 May 2013).

## ACMA's decision making process on spectrum for PSMB

2.19 The factors that influenced the ACMA's decision to provide 10 MHz of spectrum for PSMB included:

- evidence before, and work of, the PSMBSC including the UXC Consulting report and the proposed National Implementation Plan;
- the need for provisions to help meet PSA's data demand over and above the anticipated day-to-day and pre-planned scenarios including:
  - additional use of commercial networks for non-mission critical traffic;
  - as needed deployments of mobile base stations, or 'cells on wheels' (COWs) to absorb additional local demand;
  - use of the 4.9 GHz band to enable deployment of high capacity, localised 'hot spots' for data offload, video transfer and incident area networks, among other applications; and
  - specific provisions under the Radiocommunications Act that could, if enacted, enable access to additional spectrum by responders in extreme circumstances;
- economic factors including capex/opex versus spectrum costs; and
- constraining and mitigating technical factors, including demand growth, headroom requirements and efficiency gains to be leveraged as part of the evolutionary growth of the technology (as per 3GPP standards).<sup>27</sup>

2.20 The ACMA emphasised that during the PSMBSC process, it was recognised that no amount of spectrum used by a conventional cellular network was likely to satisfy a localised, short-notice spike in demand that might result from a major incident such as a terrorist attack in a central business district or major urban centre. Furthermore, the ACMA argued that it would be highly economically inefficient to try and dimension spectrum provisions around what might be 'once-in-a-generation' events.<sup>28</sup> The ACMA asserted that one of the key purposes of the spectrum being made available in the 4.9 GHz band will be to enable high data rates in localised hot spots such as around an incident site. According to the ACMA, this band will 'complement the proposed PSMB capability by providing on-demand capacity over and above that afforded by the fixed PSMB network'. Furthermore, the ACMA argued, there is an established market for public safety equipment operating in this band.<sup>29</sup>

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27 Australian Communications and Media Authority, *Spectrum for public safety radiocommunications, Current ACMA initiatives and decisions*, October 2012, p. 14.

28 Australian Communications and Media Authority, *Spectrum for public safety radiocommunications, Current ACMA initiatives and decisions*, October 2012, p. 14.

29 Australian Communications and Media Authority, *Spectrum for public safety radiocommunications, Current ACMA initiatives and decisions*, October 2012, p. 14

2.21 At the same time, the ACMA also highlighted the ongoing challenge before it to:

...make adequate spectrum available for PSAs to carry out their duties effectively, while optimising the benefit of the spectrum as a whole to the community. This requires balancing a range of economic and public interest (including public safety) drivers to deliver solutions that best serve the community as a whole.<sup>30</sup>

### ***Public Safety Mobile Broadband Steering Committee***

2.22 The PSMBSC was established on 30 May 2011 to consider the potential for 800 MHz to be used for emergency services broadband application.<sup>31</sup> The steering committee's role is detailed in its terms of reference:

- 1 Provide a report to Commonwealth, State and Territory Ministers and to the Standing Council for Police and Emergency Management (SCPEM) on the most effective and efficient way for Australia's public safety agencies to obtain a reliable and robust mobile broadband capability that meets their operational requirements and the potential for allocation of radio-frequency in this regard, and
- 2 Work with the Australian Communications and Media Authority (ACMA) as part of its review of the 805 MHz to 890 MHz frequency range (the 800 MHz band), to identify a suitable amount of spectrum necessary to meet foreseeable operational needs.<sup>32</sup>

2.23 The membership of the PSMBSC comprises senior officials from agencies and departments including the Attorney-General's Department (AGD), DBCDE, ACMA, and the Australia New Zealand Policing Advisory Agency (ANZPAA). Other members include the:

- Australasian Fire and Emergency Service Authorities Council;
- Council of Ambulance Authorities;
- Law Enforcement and Security Radio Spectrum Committee;
- National Coordinating Committee for Government Radiocommunications;
- National Counter-Terrorism Committee;

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30 Australian Communications and Media Authority, *Spectrum for public safety radiocommunications, current ACMA initiatives and decisions*, October 2012, p. 3, [http://www.acma.gov.au/webwr/radcomm/frequency\\_planning/radiofrequency\\_planning\\_topics/docs/spectrum\\_for\\_public\\_safety.pdf](http://www.acma.gov.au/webwr/radcomm/frequency_planning/radiofrequency_planning_topics/docs/spectrum_for_public_safety.pdf) (accessed 29 May 2013).

31 Australian Communications and Media Authority, *Spectrum for public safety radiocommunications, Current ACMA initiatives and decisions*, October 2012, p. 1, [http://www.acma.gov.au/webwr/radcomm/frequency\\_planning/radiofrequency\\_planning\\_topics/docs/spectrum\\_for\\_public\\_safety.pdf](http://www.acma.gov.au/webwr/radcomm/frequency_planning/radiofrequency_planning_topics/docs/spectrum_for_public_safety.pdf) (accessed 29 May 2013).

32 Public Safety Mobile Broadband Steering Committee, Terms of Reference, 30 May 2011, p. 1, [http://www.nationalsecurity.gov.au/www/agd/rwpattach.nsf/VAP/\(8AB0BDE0570AAD0EF9C283AA8F533E3\)~1Public+Safety+Mobile+Broadband+Steering+Committee+.pdf/\\$file/1Public+Safety+Mobile+Broadband+Steering+Committee+.pdf](http://www.nationalsecurity.gov.au/www/agd/rwpattach.nsf/VAP/(8AB0BDE0570AAD0EF9C283AA8F533E3)~1Public+Safety+Mobile+Broadband+Steering+Committee+.pdf/$file/1Public+Safety+Mobile+Broadband+Steering+Committee+.pdf) (accessed 18 July 2013).

- National Emergency Management Committee; and
- SCPEM Policing Senior Officers Group.

2.24 The first phase of the PSMBSC's work was to identify the amount of spectrum needed to meet PSA's long-term data demand in the 800 MHz band. To inform this process, Gibson Quai-AAS Consulting (now UXC Consulting) was commissioned to undertake the study in consultation with PSAs and Commonwealth agencies. While the report is publicly available, some content including different recommendations on the required spectrum quanta have been redacted.<sup>33</sup> To assist the PSMBSC in its deliberations, the DBCDE also commissioned a report from the Institute for a Broadband-Enabled Society on the broadband communication avenues available to public safety agencies. The report was released in December 2012.<sup>34</sup>

2.25 The PSMBSC developed a draft National Implementation Plan which details the intentions of the jurisdictions regarding what type of capability (including infrastructure and coverage aspects) they intend to deliver. The PSMBSC itself is responsible for operating the network.<sup>35</sup> The draft National Implementation Plan and PSMBSC report were provided to the SCPEM on 10 October 2012 for consideration at its 23 November 2012 meeting.<sup>36</sup> The plan considers the most effective way for PSAs to obtain a nationally interoperable PSMB capability.<sup>37</sup>

2.26 The PSMBSC is expected to provide its report on the establishment of a nationally interoperable PSMB network to the COAG through the SCPEM in 2013.<sup>38</sup>

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- 33 Gibson Quai-AAS Consulting, *Public Safety Mobile Broadband 700 MHz DD & 800 MHz PSMB Band Comparison, Final Report*, April 2012, [www.acma.gov.au/webwr/assets/main/.../foi\\_log\\_18-docs\\_19d-19e.pdf](http://www.acma.gov.au/webwr/assets/main/.../foi_log_18-docs_19d-19e.pdf) (accessed 30 May 2013).
- 34 Institute for a Broadband-Enabled Society, *Broadband Communications Options for Public Safety Agencies*, December 2012, [http://www.dbcde.gov.au/\\_data/assets/pdf\\_file/0014/161501/Broadband-Communications-Options-for-Public-Safety-Agencies.pdf](http://www.dbcde.gov.au/_data/assets/pdf_file/0014/161501/Broadband-Communications-Options-for-Public-Safety-Agencies.pdf) (accessed 30 May 2013).
- 35 Australian Communications and Media Authority, *Spectrum for public safety radiocommunications, Current ACMA initiatives and decisions*, October 2012, p. 10, [http://www.acma.gov.au/webwr/radcomm/frequency\\_planning/radiofrequency\\_planning\\_topics/docs/spectrum\\_for\\_public\\_safety.pdf](http://www.acma.gov.au/webwr/radcomm/frequency_planning/radiofrequency_planning_topics/docs/spectrum_for_public_safety.pdf) (accessed 29 May 2013).
- 36 Attorney-General's Department, *Public Safety Mobile Broadband: Report to SCPEM and National Implementation Plan*, 10 October 2012, [http://www.acma.gov.au/webwr/assets/main/lib550099/foi\\_log\\_18-docs\\_18-19c.pdf](http://www.acma.gov.au/webwr/assets/main/lib550099/foi_log_18-docs_18-19c.pdf) (accessed 30 May 2013).
- 37 Department of Broadband, Communications and the Digital Economy, *Submission 14*, p. 1.
- 38 Department of Broadband, Communications and the Digital Economy, 'Public Safety Mobile Broadband Steering Committee', 22 February 2013, [http://www.dbcde.gov.au/broadband/public\\_safety\\_mobile\\_broadband\\_steering\\_committee](http://www.dbcde.gov.au/broadband/public_safety_mobile_broadband_steering_committee) (accessed 29 May 2013).

### ***Standing Council on Police and Emergency Management***

2.27 The SCPEM met on 23 November 2012. However, the communique in relation to the meeting has not been made public.<sup>39</sup> According to the DBCDE, the SCPEM endorsed the draft National Implementation Plan and PSMBSC report.

2.28 The SCPEM also requested that the PSMBSC continue its work in three areas, namely:

- jurisdictions provide any additional evidence on the adequacy of the 10 MHz reservation in the 800 MHz band;
- how an 'overflow' capability can be assured when the PSMB capability is not available; and
- next steps to agree the design and implementation of the network.<sup>40</sup>

### **Digital dividend auction**

2.29 On 1 November 2011, the Australian Government announced that two blocks of spectrum in the 700 MHz band (digital dividend) and two blocks of spectrum in the 2.5 GHz bands would be reallocated by issuing spectrum licences after TV broadcasters shut off analogue broadcasts at the end of 2014.<sup>41</sup> The ACMA organised an auction of spectrum in both bands where telecommunications companies could each purchase no more than 2 x 25 MHz (50 MHz in total) of 700 MHz spectrum.<sup>42</sup>

2.30 In relation to PSAs and the 700 MHz band, Access Economics noted in a September 2010 report that if PSAs were to seek an allocation in that band, it had been recommended that they seek 10 + 10 MHz to ensure adequate capacity.<sup>43</sup> Access Economics stated that the 700 MHz band frequency range was:

...well suited to Long-Term Evolution (LTE) technologies that will enable high-speed broadband applications, and the emerging use of LTE technology on the 700 MHz band internationally means there may be some equipment synergies. In addition, a PSA network at 700 MHz would be

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39 Standing Council on Police and Emergency Management, 23 November 2012, Communique, <http://www.ag.gov.au/EmergencyManagement/Pages/StandingCouncilonPoliceandEmergencyManagementMeetingDatesandCommunique.aspx> (accessed 30 May 2013).

40 Department of Broadband, Communications and the Digital Economy, *Submission 14*, p. 2.

41 Department of Broadband, Communications and the Digital Economy, Digital dividend process, [http://www.archive.dbcde.gov.au/2013/may/digital\\_dividend](http://www.archive.dbcde.gov.au/2013/may/digital_dividend) (accessed 30 May 2013).

42 Australian Communications and Media Authority, *Digital Dividend auction—results*, 7 May 2013, <http://engage.acma.gov.au/digitaldividend/digital-dividend-auction-results/> (accessed 30 May 2013).

43 Access Economics, *Radiofrequency Spectrum Options for Public Safety Agencies*, September 2010, p. 17, <http://www.ag.gov.au/RightsAndProtections/FOI/Documents/Access%20Economics%20Report%20dated%202010%20September%202010%20entitled%20Radiofrequency%20Spectrum%20Options%20for%20Public%20Safety%20Agencies.pdf> (accessed 15 July 2013).



able to leverage substantially off the existing 450 MHz infrastructure, for which infrastructure was built with site overlap.

However, the appropriateness of the digital dividend for LTE technology means that it is expected to be an in-demand band when the auction takes place.<sup>44</sup>

2.31 The auction commenced on 23 April 2013 and three bidders, Optus Mobile, Telstra and TPG Internet secured spectrum in the auction, resulting in total revenues of \$1.96 billion. This was less than half the amount which was expected to be raised at the auction (\$4 billion). Four companies initially applied to participate in the auction, however, Vodafone Hutchison Australia withdrew before the auction.<sup>45</sup>

2.32 The auction reflected a less than expected desire by telecommunications companies for 700 MHz with 2 x 15 MHz or 30 MHz spectrum in total left unsold (sections 733–748 MHz and 788–803 MHz).<sup>46</sup> The unallocated 30 MHz of spectrum has a 3GPP standard which enables LTE to operate in it.<sup>47</sup>

2.33 The Minister, Senator the Hon Stephen Conroy stated that the 30 MHz (or 15 MHz paired) of the 700 MHz unsold spectrum was worth 'in the order of \$1 billion' and that the government intended to return it to the market within two or three years.<sup>48</sup> The expectation of some stakeholders was that the unsold spectrum would be made available when Australia's television services switch to digital services by 2015.<sup>49</sup>

2.34 In evidence to the committee, the ACMA noted that while the unsold spectrum is currently unallocated, it does not have the ability to allocate it. At the same time, Mrs Maureen Cahill, General Manager, Communications Infrastructure

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44 Access Economics, *Radiofrequency Spectrum Options for Public Safety Agencies*, September 2010, p. 17.

45 Adam Bender, 'Optus satisfied with spectrum winnings in Digital Dividend auction', *Computerworld*, 15 May 2013, [http://www.techworld.com.au/article/461886/optus\\_satisfied\\_spectrum\\_winnings\\_digital\\_dividend\\_auction/](http://www.techworld.com.au/article/461886/optus_satisfied_spectrum_winnings_digital_dividend_auction/) (accessed 5 June 2013); Josh Taylor, 'Telstra, Optus, TPG win 4G spectrum for AU\$2 billion', *ZDNet*, 7 May 2013, <http://www.zdnet.com/au/telstra-optus-tpg-win-4g-spectrum-for-au2-billion-7000014961/> (accessed 6 June 2013).

46 ACMA, 'Digital dividend auction—results', *ACMA media release—27/2013—7 May 2013*, <http://www.beta.acma.gov.au/Industry/Spectrum/Digital-Dividend-700MHz-and-25Gz-Auction/Reallocation/digital-dividend-auction-results> (accessed 5 June 2013); Mr Jeff MacKenzie, 'Digital Dividend Auction Results', *Jands*, 7 May 2013, [http://www.jands.com.au/support/product\\_support/audio\\_technical\\_materials/wireless\\_spectrum/digital\\_dividend\\_auction\\_results](http://www.jands.com.au/support/product_support/audio_technical_materials/wireless_spectrum/digital_dividend_auction_results) (accessed 5 June 2013).

47 Dr Andrew Kerans, ACMA, *Committee Hansard*, 24 June 2013, p. 18.

48 Senator the Hon Stephen Conroy, Minister for Broadband, Communications and the Digital Economy, 'Digital Dividend Auction Results', *Media Release*, 7 May 2013, [http://www.minister.dbcde.gov.au/media/media\\_releases/2013/069](http://www.minister.dbcde.gov.au/media/media_releases/2013/069) (accessed 5 June 2013); David Crowe, 'Counting on spectrum sale despite flop', *The Australian*, 15 May 2013, <http://www.theaustralian.com.au/national-affairs/treasury/counting-on-spectrum-sale-despite-flop/story-fnhi8df6-1226642539099> (accessed 5 June 2013).

49 Police Federation of Australia, *Submission 2*, p. 3.

Division of ACMA, stated that domestic mobile broadband growth suggests that it will need to deliver to the Australian market at least an additional 300 MHz of spectrum by 2020 in addition to what is currently on the marketplace.<sup>50</sup>

### Unsold spectrum

2.35 The lack of take-up of the remaining 30 MHz of spectrum in the 700 MHz band marked a new phase in the debate regarding the appropriate allocation of spectrum for PSMB. It opened up the possibility for PSAs to occupy a block of spectrum in the 700 MHz band. State and territory governments noted in their evidence to the committee that their understanding was that PSAs were offered spectrum in the 800 MHz band for reasons including the commercial value of the 700 MHz band and the assumption that there would be no 700 MHz spectrum available following the auction.<sup>51</sup> Therefore, the documentation and work undertaken by emergency services focused on the 800 MHz spectrum band as it was understood that the 700 MHz spectrum would be sold at auction and therefore 'off the table'.<sup>52</sup>

2.36 Over the past three years, a number of states and territories, law enforcement agencies, as well as the PFA have stated their position that PSAs require a minimum of 20 MHz (10 + 10 MHz) on a number of occasions.<sup>53</sup> Emergency service agencies have consistently raised the need for a dedicated broadband spectrum particularly as their data requirements continue to increase with technological advances.<sup>54</sup> In February 2010, the LESRSC noted that:

Considering US experience, public safety and emergency services may require at least 10+10 MHz spectrum from the 700 MHz band, the 850 MHz band or the 900 MHz band to establish their mobile broadband communications networks to support Government uses.<sup>55</sup>

2.37 In July 2012, the Premiers of NSW, Victoria, Queensland and Western Australia wrote to the Prime Minister requesting an allocation of an absolute minimum 20 MHz (10 + 10 MHz).<sup>56</sup> In February 2013, in order to facilitate further consideration of the states' requirement for additional spectrum, a joint submission of

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50 Mrs Maureen Cahill, ACMA, *Committee Hansard*, 24 June 2013, p. 12.

51 Western Australian Government, *Submission 4*, p. 3.

52 Mr Jim Hewitt, National Coordinating Committee for Government Radiocommunications, *Committee Hansard*, 24 June 2013, p. 37.

53 NSW Police Force, *Submission 17*, p. 1.

54 Evidence from emergency service organisations to Senate Environment and Communications References Committee, *The capacity of communications networks and emergency warning systems to deal with emergencies and natural disasters*, November 2011, p. 19.

55 Law Enforcement and Security Radio Spectrum Committee, LESRSC Response to Digital Dividend Green Paper January 2010, 25 February 2010, p. 3, [http://www.dbcde.gov.au/\\_data/assets/pdf\\_file/0010/127369/Law\\_Enforcement\\_and\\_Security\\_Radio\\_Spectrum\\_Committee\\_-\\_PUBLIC\\_VERSION.pdf](http://www.dbcde.gov.au/_data/assets/pdf_file/0010/127369/Law_Enforcement_and_Security_Radio_Spectrum_Committee_-_PUBLIC_VERSION.pdf) (accessed 3 June 2013).

56 Western Australian Government, *Submission 4*, p. 1; Western Australian Government, *Submission 4*, Attachment 1, p. 1.



the governments of the ACT, NSW, Queensland, South Australia, Tasmania, Victoria and Western Australia was made to the SCPEM and ACMA. Endorsed by the Police and Emergency Services Ministers in all states and territories through SCPEM in April 2013 and noted by the COAG the same month, the joint submission identified three primary concerns with the ACMA announcement which are considered in this report.<sup>57</sup> The PFA has also consistently advocated for 20 MHz since June 2010.<sup>58</sup>

2.38 The position upheld by law enforcement agencies and various jurisdictions that the ACMA 'set aside evidence of the operational requirements of law enforcement agencies in preference for a multi-layered spectrum solution' is central to this inquiry.<sup>59</sup>

### **ACMA considerations and final decision**

2.39 As part of finalising a decision regarding allocation of PSMB, the ACMA informed the committee that it was currently reviewing the evidence contained in the joint state and territory submission which raised concerns about the allocation of only 10 MHz. The ACMA is also awaiting the overflow capability report which the Overflow Capabilities Sub-Group is due to produce.<sup>60</sup>

2.40 In November 2012, when it addressed the steering committee, the ACMA indicated that it would consider further evidence provided to it. As noted, the governments of WA, ACT, NSW, Queensland, South Australia, and Tasmania responded in February 2013, providing additional evidence by way of a joint submission the ACMA and the SCPEM.<sup>61</sup>

2.41 The ACMA emphasised that the decision making process that it is engaged in is 'evidence-based' and that it would review the material brought before it.<sup>62</sup> However, the ACMA was unable to determine when a final decision regarding an allocation of spectrum for PSMB would be made.<sup>63</sup> Mr Chris Cheah, Authority Member of the ACMA, noted that a final determination would be made 'as soon as possible after receipt of the overflow capability work' which will be provided 'later this year'.<sup>64</sup>

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57 Western Australian Government, *Submission 4*, Attachment 2, p. 4.

58 Police Federation of Australia, *Submission 2*, pp 1 & 3.

59 NSW Police Force, *Submission 17*, p. 1.

60 Mr Chris Cheah, ACMA, *Committee Hansard*, 24 June 2013, p. 20.

61 Joint States and Territories Submission to the Standing Council on Police and Emergency Management and the Australian Communications and Media Authority, Further Evidence from Jurisdictions, February 2013 cited as Western Australian Government, *Submission 4*, Attachment 2, p. 4.

62 Mr Chris Cheah, ACMA, *Committee Hansard*, 24 June 2013, p. 16.

63 Mr Chris Cheah, ACMA, *Committee Hansard*, 24 June 2013, p. 20.

64 Mr Chris Cheah, ACMA, *Committee Hansard*, 24 June 2013, p. 20.

### **Draft Ministerial Directions – 700 MHz band**

2.42 On 24 June 2013, the Minister for Broadband, Communications and the Digital Economy, Senator the Hon Stephen Conroy, released two draft Ministerial Directions for public consultation.<sup>65</sup>

2.43 The purpose of the Australian Communications and Media Authority (Spectrum Allocation – Timing and Post-Auction Review) Direction No. 1 of 2013 is to direct the ACMA to report to the Minister by 1 September 2014 on the appropriate procedures for the allocation of the unsold 700 MHz spectrum, having regard to:

- the prices achieved for spectrum licences allocated as a result of the digital dividend auction; and
- prevailing market circumstances that may have an impact on the value of the spectrum.

2.44 The purpose of the Radiocommunications (Spectrum Access Charges – 700 MHz Band) Direction No. 1 of 2013 is to direct the ACMA that in any pricing determination the ACMA makes for the unsold 700 MHz spectrum under subsection 294(1) of the Radiocommunications Act, the ACMA must fix the spectrum access charges at no less than \$1.36/MHz/pop.

2.45 Public consultation opened the day that the Ministerial Directions were issued with submissions due by 19 July 2013.<sup>66</sup>

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65 Department of Broadband, Communications and the Digital Economy, '700 MHz Band – Draft Ministerial Directions release for public consultation', 25 June 2013, [http://www.dbcde.gov.au/consultation\\_and\\_submissions/draft\\_ministerial\\_directions\\_to\\_the\\_acma\\_on\\_700\\_mhz\\_band](http://www.dbcde.gov.au/consultation_and_submissions/draft_ministerial_directions_to_the_acma_on_700_mhz_band) (accessed 25 June 2013).

66 Department of Broadband, Communications and the Digital Economy, '700 MHz Band – Draft Ministerial Directions release for public consultation', 25 June 2013.

## CHAPTER 3

### Generational change in the emergency services world

3.1 Without exception, all witnesses to the inquiry recognised the need for PSAs to access sufficient and appropriate spectrum to enable the deployment of dedicated mission-critical mobile broadband capability.<sup>1</sup> The need to ensure that PSAs are provided adequate capabilities to respond efficiently and effectively when disasters occur has been agreed by all Australian governments.<sup>2</sup>

3.2 While it is recognised that achieving a national dedicated PSMB network requires that historical problems be addressed, namely the lack of a common platform for public safety agencies and the communication capabilities between them, the advantages amount to a generational change in the world of emergency services. This chapter explores the advantages and challenges for PSAs in relation to spectrum for PSMB.

#### Operational benefits

3.3 Access to next-generation technology provides PSAs with the capability to access real-time, accurate information and realise tailored mobile broadband connection speeds, while utilising rich-media applications with the appropriate level of prioritisation from advanced collaborative data services.<sup>3</sup> Such technology has the potential not only to make policing and emergency responses more efficient but also to safeguard the public. Mr Mark Burgess, Chief Executive Officer of the 57,000 member strong PFA explained:

With things such as video streaming, you can imagine that in high speed pursuits safety is involved not only for officers but for the community. There is the issue of body-worn cameras in a whole range of scenarios, not the least of which is general policing but certainly in major incident events. Then there are cameras on vehicles and other features in vehicles such as facial recognition and automatic numberplate recognition systems. All of those things are going to add significant value to the ability of police to operate into the future. This is a generational opportunity for policing to get access to such technology.<sup>4</sup>

3.4 Mobile broadband has the capacity to provide information by way of voice and video in real time to police and emergency officials in the field.<sup>5</sup>

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1 Orange Horizons Pty Ltd, *Submission 1*; Police Federation of Australia, *Submission 2*; Motorola Solutions, *Submission 10*; Ericsson, *Submission 3*; Western Australian Government, *Submission 4*; ACT Government *Submission 12*; Telstra, *Submission 11*.

2 Western Australian Government, *Submission 4*, p. 1.

3 Motorola Solutions, *Submission 10*, p. [9].

4 Mr Mark Burgess, PFA, *Committee Hansard*, 17 June 2013, p. 2.

5 Assistant Commissioner Peter Barrie, NSW Police Force, *Committee Hansard*, 17 June 2013, p. 9.

3.5 Assistant Commissioner Peter Barrie of the NSW Police Force commented that spectrum for PMMB was part of a full information and communications technology (ICT) solution that PSAs require to provide services in the future, look after its workforce, and provide a better community and public safety response.<sup>6</sup> He explained the differences for police between receiving voice information and that of video and visual images:

So the difference might be, in responding to a bank robbery, looking for a male dressed in dark clothing who is perhaps 188 centimetres tall and of 92 kilos, or average build as opposed to having an image of the chap that you are looking for. That is powerful stuff in terms of looking after the interests of the people that are responding, enhancing public safety and our ability to, if we encounter that individual, confine the situation.<sup>7</sup>

3.6 Ericsson noted that there were two key aspects to public safety operations which can be enhanced through utilisation of mobile broadband including enhanced situation awareness and achievement of a common operating picture.<sup>8</sup> Furthermore, as Ericsson explained:

As LTE can deliver high-speed mobile broadband, a range of rich communications services are enabled, including video, presence and voice—all delivered over a native IP network. Due to the open standards upon which LTE is based, it will be possible in the future to deploy new, innovative apps, thereby further enhancing the utility of any mobile broadband network. The availability of this additional level of detailed information has the potential to improve incident assessment and response management.<sup>9</sup>

3.7 Access Economics identified three key areas which would benefit from the use of video links and emerging technology for PSAs including incident response, incident management and control, and post-incident review. The benefits that would result from improvements in each of these areas would include:

- improved coordination of a range of emergencies (such as fire or storms), with reduced loss of life and property;
- more effective crowd control, with implications for both costs and outcomes;
- more effective and less costly surveillance; and

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6 Assistant Commissioner Peter Barrie, NSW Police Force, *Committee Hansard*, 17 June 2013, p. 9.

7 Assistant Commissioner Peter Barrie, NSW Police Force, *Committee Hansard*, 17 June 2013, p. 10.

8 Ericsson, *Submission 3*, p. 9.

9 Ericsson, *Submission 3*, p. 9.

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- improved care for accident victims at the scene and in-transit to medical facilities.<sup>10</sup>

3.8 Tait Communications argued that access to mobile information creates a wider situational awareness that can contribute to operational efficiency and officer safety. It provided the following examples:

...streaming video from accident site to dispatchers to deploy appropriate apparatus, ambulatory staff streaming video and patient health to hospital staff while en-route, central dispatch pushing pictures and mapping locations of suspicious persons to in-field commanders, real-time identity checks of vehicles, suspects and locations, and providing full visibility to central fire command of resource availability and response time during volunteer call outs. Maximising operational frontline hours and minimising administrative hours through automation of reporting using mobile devices will deliver results to the community as front-line staff will have more time to patrol and respond to emergencies.<sup>11</sup>

3.9 Assistant Commissioner Barrie from the NSW Police Service noted that access to such technology would maximise investigative effort and specialist resources. He explained that with a limited pool of experts in areas such as forensics and accident investigation, police services were unable to deploy such resources to every location. However, video streaming is one mechanism that can allow specialists to remotely examine crime scenes and in real-time, immerse themselves from a central location into that scene and provide the necessary expertise.<sup>12</sup> Without the need for specialists to travel to a crime scene, access to such technology will reduce the length of an investigation and costs to both the community and the state.<sup>13</sup> From a daily policing perspective, moreover, substantial enhancements can be utilised as Assistant Commissioner Barrie explained:

...in terms of maximising our investigative effort, realising our responsibilities to provide evidence to the court and to the coroner, but at the same time having an awareness of the commercial impact of our activities—if you take that to the investigation of a fatal accident that has occurred on a major arterial route, it is a fine balance. You want to be able to realise all the evidence that is there. You want to investigate that matter thoroughly. You want to look after the welfare of anyone who may have been injured. Certainly you want to look after the first responders in terms

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10 Access Economics, *Radiofrequency Spectrum Options for Public Safety Agencies*, September 2010, p. 5,

<http://www.ag.gov.au/RightsAndProtections/FOI/Documents/Access%20Economics%20Report%20dated%2010%20September%202010%20entitled%20Radiofrequency%20Spectrum%20Options%20for%20Public%20Safety%20Agencies.pdf> (accessed 10 July 2013).

11 Tait Communications, *Submission 8*, p. 6.

12 Assistant Commissioner Peter Barrie, NSW Police Force, *Committee Hansard*, 17 June 2013, p. 11.

13 Assistant Commissioner Peter Barrie, NSW Police Force, *Committee Hansard*, 17 June 2013, p. 11.

of any hazards that might be in that area, if it is a tanker, say, or something that is carrying a hazardous material. But also we are well aware of the impact on the state, or on businesses that are trying to operate, perhaps across the Sydney basin or Melbourne or the like, who are caught up in these massive traffic jams. Essentially, business comes to a stop.<sup>14</sup>

3.10 Assistant Commissioner Barrie also explained that the technologies that align with mobile broadband capability, such as spatial technology, are developing at an equivalent pace. These technologies provide the capability to gather information about an event such as a fire or a flood and to model it against what is already known in order to identify the location of critical infrastructure and potential hazards. For example, information from members of the public provided through various media including social media, telephone and triple zero calls, as well as that from first responders in the field and data agencies such as the Bureau of Meteorology concerning the likely impact of impending weather events can be mapped and made available to decision makers at operational centres in real time.<sup>15</sup>

3.11 Deputy Commissioner Michael Phelan of the Australian Federal Police (AFP) similarly noted that decision making is improved if better quality information is provided. He explained that:

If we go back to natural disasters in the ACT, to the fires 10 years ago, then one could imagine that it would be much easier to make decisions in the operations centre if you have high-quality video coming from the field.<sup>16</sup>

3.12 Motorola Solutions provided the following list of applications identified by PSAs that will assist in policing, emergency operations and upholding community safety.<sup>17</sup>

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14 Assistant Commissioner Peter Barrie, NSW Police Force, *Committee Hansard*, 17 June 2013, p. 11.

15 Assistant Commissioner Peter Barrie, NSW Police Force, *Committee Hansard*, 17 June 2013, p. 16.

16 Deputy Commissioner Michael Phelan, AFP, *Committee Hansard*, 17 June 2013, p. 17.

17 Motorola Solutions, *Submission 10*, pp [10–11].

**Figure 3.1: Applications identified by public safety organisations**

<b>Application</b>	<b>Feature</b>	<b>Public safety example</b>
Video	Video streaming, live video feed, Download/Upload of video clips	Video clips
		Patient monitoring (may require dedicated link)
		Video feed of in-progress incident
		Video communications from wireless clip-on cameras used by in building fire rescue
		Image or video to assist remote medial support
		Surveillance of incident scene by fixed or remote controlled robotic devices
		Assessment of fire/flood scenes from airborne platforms
Real-time multimedia Intelligence	Real time optimisation of video or other multimedia content	Optimise throughput capacity by adjusting rich media content to available bandwidth and devise screen size
Imagery	Download/upload of High resolution images	Downloading earth exploration-satellite images
		Real-time medical imaging
		Biometrics (finger prints)
		ID picture
		Building layout maps
Voice	Person-to person	Selective calling and addressing
	Push-to-talk	Push-to-talk
	Instantaneous access to voice path	Push-to-talk and selective priority access
Group Voice	One-to-many	Dispatch & group communication
Direct Mode Voice	Talk-around/direct mode operation	Groups of portable (mobile-mobile) in close proximity without infrastructure
Direct mode operation of video & data	Direct unit to unit video & data communication without infrastructure	Direct handset to handset, on-scene localized command & control

## Interoperability

3.13 As noted in Chapter 1, interoperability has remained an historical challenge for PSAs and was highlighted as a key concern in evidence to the committee. The WA Government drew attention to the 2009 Victorian Bushfire Royal Commission and the review of the 2010–11 Flood Warnings and Response which noted positive impacts resulting from improved information sharing between agencies and the community before, during and after emergency incidents. The Queensland Flood Commission of Inquiry recognised the provision of broadband spectrum to Australia's emergency services organisations as vital.<sup>18</sup>

3.14 Similarly, the states and territories which gave evidence to the inquiry recognised the need for a higher level of information interoperability between emergency services now and into the future. The WA, ACT, Victorian and NSW governments highlighted that broadband spectrum will form the basis for the applications driving this higher level of information sharing.<sup>19</sup>

3.15 In their report to COAG, the Natural Disaster Arrangements Working Group and the NCCGR noted that improvements to interoperability arising from the national framework will enable government radiocommunications users to:

- more effectively use their own equipment across jurisdictions, enabling more effective and efficient cross-jurisdictional operations and more rapid deployment of emergency responders;
- more effectively undertake their daily operations covering responses to routine public safety such as building fires that may require support from several agencies within a jurisdiction or during police vehicle pursuits that may cross boundaries requiring cross-jurisdictional assistance;
- seamlessly switch from day-to-day communications to multi-agency and/or cross jurisdictional communications required in an emergency situation such as natural disasters, catastrophic accidents, large scale incidents, and similar events that may occur without much warning; and
- take advantage of new and emerging technologies that support improved interoperability as a result of a nationally consistent coordinated approach to improving interoperability.<sup>20</sup>

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18 Queensland Floods Commission of Inquiry, Final Report, March 2012, p. 399, [http://www.floodcommission.qld.gov.au/\\_data/assets/pdf\\_file/0007/11698/QFCI-Final-Report-March-2012.pdf](http://www.floodcommission.qld.gov.au/_data/assets/pdf_file/0007/11698/QFCI-Final-Report-March-2012.pdf) (accessed 15 July 2013).

19 Western Australian Government, *Submission 4*, p. 3; ACT Government, *Submission 12*, p. 3; Victorian Government, *Submission 15*, p. 3; NSW Government, *Submission 16*, p. 3.

20 Natural Disaster Arrangements Working Group and National Coordinating Committee for Government Radiocommunications *National Framework to Improve Government Radiocommunications Interoperability*, 2009, p. 6, <http://www.em.gov.au/Documents/Nationa%20Framework%20to%20Improve%20Government%20Radiocommunications.pdf> (accessed 19 June 2013).



3.16 Interoperability was of particular importance to the AFP which noted that currently, the AFP voice network is compatible with that of some jurisdictions and not with others.<sup>21</sup> Furthermore, interoperability for the AFP would amount to a cost saving as the AFP would not have to maintain and utilise different equipment to operate in different states. Deputy Commissioner Michael Phelan further observed that:

To be quite frank, the Australian Federal Police does next to nothing on its own anymore without working with its state and territory and other Commonwealth partners in all of the jurisdictions in which we work. To have incompatible data systems along with incompatible radio systems makes no operational sense as far as we are concerned.<sup>22</sup>

### **Occupational health and safety of first responders**

3.17 There are 400,000 emergency services personnel in Australia.<sup>23</sup> The PFA described the provision of 21<sup>st</sup> century mobile broadband communications as 'vital' to the work, health and safety of the police force and in particular, officers working on the front-line.<sup>24</sup> Police officers need the best intelligence about the offenders they are pursuing, up-to-date situational awareness, and data, video and other forms of critical information to operate to maximum effectiveness and safety in the interests of both the community and their own welfare and wellbeing. As the PFA noted:

Police officer health and safety is one of the key reasons why adequate spectrum for Australia's law enforcement agencies is essential.<sup>25</sup>

3.18 The NSW Police Force explained that there are innovative solutions available to significantly enhance the safety of first responders deployed in hazardous situations. These include the use of technology to monitor their personal welfare and identify their surrounds in order to identify potential threats. Real time collection and analysis of data against existing information holdings would provide improved modelling, enhanced information sharing and more accurate risk assessment. Within this context, the NSW Police Force concluded that:

The provision of accurate and timely information through the operation of mobile broadband technology will be a key element in the future protection of first responders operating in hazardous environments.<sup>26</sup>

3.19 Mr Robert Waites, Consultant with the PFA, explained that the provision of adequate spectrum would be a 'game changer' in the way PSAs operate. He noted that:

It gives police officers, fire officers and ambulance officers a lot more information, and access to a lot more information, to do their jobs much more efficiently. And in being more efficient they will save lives, save

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21 Deputy Commissioner Michael Phelan, AFP, *Committee Hansard*, 17 June 2013, p. 19.

22 Deputy Commissioner Michael Phelan, AFP, *Committee Hansard*, 17 June 2013, p. 20.

23 Mr Vince Kelly, PFA, *Committee Hansard*, 17 June 2013, p. 2.

24 Police Federation of Australia, *Submission 2*, p. 12.

25 Police Federation of Australia, *Submission 2*, p. 13.

26 NSW Police Force, *Submission 17*, p. 3.

money for the community, and look after their own members at the same time.<sup>27</sup>

3.20 Mr Burgess of the PFA noted that it was an expectation that police and emergency officers were given as much available information as possible before they attend the scene of an incident. The ability to send and receive appropriate data and vision is paramount for policing and the safety of police officers. For example, in the future, police cars could carry cameras for video in addition to other cameras around the car, to enable clear identification of what is happening in and around a particular scene at any given moment.<sup>28</sup>

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27 Mr Robert Waites, PFA, *Committee Hansard*, 17 June 2013, p. 3.

28 Mr Mark Burgess, PFA, *Committee Hansard*, 17 June 2013, p. 6.

## CHAPTER 4

### Adequate spectrum for public safety agencies

4.1 This chapter considers the provision of spectrum for PSAs. Case studies and recent policing and emergency incidents are considered to explore the difference in capability of both 10 MHz and 20 MHz and the impact and consequences for PSAs.

4.2 Without exception, witnesses to the inquiry agreed that adequate spectrum for PSAs will enable them to leverage new and emerging technological advances to ensure the greatest protection of the community.<sup>1</sup> However, there was considerable difference in opinion as to what constitutes 'adequate' spectrum for the purposes of a PSMB network. This chapter explores these respective positions and the evidence that underpins them.

#### Operational scenarios considered by the ACMA

4.3 The ACMA provided evidence that the PSMBSC surveyed the needs and views of PSAs in relation to their potential mobile broadband data demand to the year 2020 and collated those responses into a range of five operational scenarios. The ACMA reported that those scenarios included day-to-day non-emergency use (business-as-usual); various emergency scenarios including natural disasters; and a major inner-metro (worst case) threat response.<sup>2</sup>

4.4 Mr Cheah, Authority Member of the ACMA, informed the committee that the ACMA's analysis identified a total of 10 MHz of spectrum (5 MHz + 5 MHz) as sufficient to meet the demands of agencies in four of the five scenarios which included business-as-usual, planned major events and natural disaster scenarios.<sup>3</sup> Spectrum allocated to PSAs was considered sufficient for all scenarios modelled except for the worst case scenario which the ACMA argued would not be served solely by a PSMB network even if 20 MHz were offered.<sup>4</sup>

4.5 The large scale incidents modelled by the PSMBSC were based on two natural disasters including one based on actual events and the other on an extreme inner-urban threat response. On the worst case scenario, Mr Cheah added that the key issue in such a situation was not having large amounts of 'valuable spectrum unused on standby but, rather, having arrangements in place so that the agencies are able to get access to quickly-scalable communications capacity'.<sup>5</sup> The ACMA argued that there were other means available to PSAs for serving large amounts of highly-

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1 Telstra, *Submission 11*, p. 3; AMTA noted that it was 'vital' for PSAs to have access to the latest technology. AMTA, *Submission 6*, p. 2.

2 Australian Communications and Media Authority, *Submission 7*, p. [3].

3 Mr Chris Cheah, ACMA, *Committee Hansard*, 24 June 2013, p. 8.

4 Australian Communications and Media Authority, *Submission 7*, p. [3].

5 Mr Chris Cheah, ACMA, *Committee Hansard*, 24 June 2013, p. 8.

concentrated and localised traffic such as 4.9 GHz, deployment of cells on wheels (COWs) and the potential for increased use of commercial services.<sup>6</sup>

4.6 In an October 2012 publication regarding its initiatives and decisions, the ACMA noted the following in relation to the provision of spectrum:

Throughout the PSMBSC process, it has been recognised that no amount of spectrum used by a conventional cellular network is likely to satisfy a localised, short-notice spike in demand that might result from a major incident such as a terrorist attack in a central business district or major urban centre. Furthermore, it would be highly economically inefficient to try and dimension spectrum provisions around what might be a once-in-a-generation event. Instead, the ACMA has identified other ways to increase capacity that are likely to be more effective in practice.<sup>7</sup>

4.7 The same publication noted that the ACMA did not consider it appropriate to provide high value spectrum for rare contingencies such as worst case events. Mr Cheah of the ACMA noted its opinion in March 2013 that 10 MHz was sufficient for the scenarios modelled including regional disaster responses. He continued that if the ACMA provided 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'. Mr Cheah concluded that:

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.<sup>8</sup>

4.8 The ACMA's allocation of 10 MHz was supported by other witnesses to the inquiry including the Australian Mobile Telecommunications Association (AMTA) which recognised that 10 MHz as likely to exceed the modelled requirements of a nationally interoperable PSMB capability.<sup>9</sup> AMTA held the view that as the ACMA's modelling showed that 20 MHz would not be sufficient for a 'once-in-a-generation' event, the likelihood of such an event 'means that it would be ineffective and irresponsible to allocate more than 10 MHz of spectrum to cater for such a worst case scenario'.<sup>10</sup>

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6 Australian Communications and Media Authority, *Submission 7*, p. [3]; Australian Communications and Media Authority, *Spectrum for public safety radiocommunications, Current ACMA initiatives and decisions*, October 2012, p. 14.

7 Australian Communications and Media Authority, *Spectrum for public safety radiocommunications, Current ACMA initiatives and decisions*, October 2012, p. 14.

8 The Australian Communications and Media Authority and the Public Safety Sector—speech by ACMA Authority Member Chris Cheah to the Association of Public-Safety Communications Officials (APCO) Australasia 10th Annual Conference, Adelaide, 13 March 2013, [http://www.acma.gov.au/webwr/assets/main/lib550085/apco-mar\\_2013\\_chris\\_cheah\\_speech.pdf](http://www.acma.gov.au/webwr/assets/main/lib550085/apco-mar_2013_chris_cheah_speech.pdf) (accessed 10 July 2013).

9 Australian Mobile Telecommunications Association, *Submission 6*, p. 2.

10 Australian Mobile Telecommunications Association, *Submission 6*, p. 6.

## Concerns raised with the scenarios considered by the ACMA

4.9 The governments of Western Australia, the ACT, Victoria and NSW highlighted that a PSMB capability must meet both business-as-usual operational needs and support responders effectively when crisis events occur.<sup>11</sup> These jurisdictions, as well as the NSW Police Service and the PFA, were consistent in their position that the ACMA's proposed allocation was based on a business-as-usual approach which had not taken into account the growth in demand for PSA services, rapid technological change including the development of PSMB applications, as well as large-scale or major events such as a terrorist incident or serious natural disaster.<sup>12</sup> The involved jurisdictions urged the allocation of an additional spectrum to the current 10 MHz reservation as soon as practicable and no later than 2020.<sup>13</sup>

4.10 In their February 2013 joint submission to the SCPEM and the ACMA, the governments of NSW, ACT, Queensland, South Australia, Tasmania, Victoria and Western Australia identified three factors that would result in a greater PSA demand for business-as-usual mobile broadband including growth in PSA numbers, operational demand for PSA applications, and the likely evolution of PSA mobile broadband applications and their associated users. The following section details these considerations as well as other evidence which raised concerns regarding the ACMA's allocation of 10 MHz of spectrum and the consequences for public safety.

### *Business-as-usual demands and population growth*

4.11 According to the submissions of the WA, ACT, Victorian and NSW governments, experience in the United States of America (USA), Canada and parts of Europe indicates that 10 MHz of spectrum does not provide sufficient bandwidth for incidents that occur 'on a daily basis'.<sup>14</sup>

4.12 The PFA raised concerns that the 10 MHz provides for spectrum for day-to-day work when nothing goes wrong.<sup>15</sup> PFA Consultant, Mr Robert Waites argued that 10 MHz will provide agencies who seek to conduct their day-to-day business at the same time with 'insufficient broadband spectrum'. Mr Waites provided an example of New Year's Eve events:

Already if you look at the major events in any capital city in Australia, and I talk personally because I was the commander of the city in Sydney for five years, on New Year's Eve data systems collapse currently. They collapse because of congestion.

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11 Western Australian Government, *Submission 4*, p. 1; ACT Government, *Submission 12*, p. 1; Victorian Government, *Submission 15*, p. 1; NSW Government, *Submission 16*, p. 1.

12 Western Australian Government, *Submission 4*, p. 1; ACT Government, *Submission 12*, p. 1; Victoria Government, *Submission 15*, p. 1; NSW Government, *Submission 16*, p. 1; NSW Police Force, *Submission 17*, p. 1; Police Federation of Australia, *Submission 2*, pp. 3 & 6.

13 Western Australian Government, *Submission 4*, p. 2.

14 Western Australian Government, *Submission 4*, p. 2; ACT Government, *Submission 12*, p. 2; Victorian Government, *Submission 15*, p. 2; NSW Government, *Submission 16*, p. 2.

15 Police Federation of Australia, *Submission 2*, p. 6.

If you have the same sort of scenario with the emergency services working on New Year's Eve, just in the inner city of Sydney, again, they will not be able to operate.<sup>16</sup>

4.13 Mr Waites of the PFA explained that from an operational perspective, the provision of 10 MHz would also mean that many first responders will not be able to get the data they require to make predictions regarding security at public events. Mr Jim Hewitt, Representative of the NCCGR, who noted that most people have 10 to 20 MHz coming into their own homes on their own asymmetric digital subscriber line (ADSL) accounts, explained that every responder who turns up to deal with a public safety incident has to share four to five MHz. Thereafter, once that share is divided up into video streams and moving GIS files (geographical information) which are substantial, the capability is going to get used up quickly. Mr Hewitt provided an example of an industrial fire that occurred in North Canberra in September 2011 whereby:

In that sort of situation you are moving mapping products out to the people in the field. You are designating where roadblocks are going to be. You are designating where plumes of smoke, possibly poisonous smoke, are going. You are designating evacuation areas. Met data is being pumped into those sorts of products. It is all going backwards and forwards from the responders and from our headquarters in Fairbairn.<sup>17</sup>

4.14 By contrast, however, Mr Waites of the PFA argued that 20 MHz would enable all responders to get the same sort of data level at all times. Furthermore, he asserted that 20 MHz would enable PSAs to effectively utilise technology such as body cameras which enable the recording of facial recognition, numberplates and building location information. Similarly, the utilisation of body biometrics would enable PSAs to monitor the wellbeing of first responders such as police officers as well as fire officers under stress during emergencies. Without the capacity to apply such technology in a timely way, agencies will not be able to understand the difficulties and stresses that their officers are undergoing.<sup>18</sup>

4.15 Assistant Commissioner Peter Barrie of the NSW Police Force explained that there were two key operational capability considerations:

The first and foremost is that to restrict to five plus five will have a significant impact on anything you want to do other than business as usual. That makes it very difficult to rely on that kind of service in terms of response to mission critical events...The second...is perhaps the difference in the quality of images that might be reasonably obtained without massive investment in infrastructure. An image of poor quality is going to be of very limited value to you, for example in the scenario...of the bank robber. In one image you might not be able to see a firearm and in the other image you would quite clearly see the firearm and the nature of it. That can have a

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16 Mr Robert Waites, PFA, *Committee Hansard*, 17 June 2013, p. 3.

17 Mr Jim Hewitt, NCCGR, *Committee Hansard*, 24 June 2013, p. 36.

18 Mr Robert Waites, PFA, *Committee Hansard*, 17 June 2013, p. 4.

significant value to us in being able to assess what the capability of that person is and what threat they pose—is it a .22 or is it a more significant firearm of high capacity, but also in terms of our ability to bring in experts into a scene from a virtual perspective. There would be limited value, I would suggest, in bringing a forensic expert in to assess a scene based on a poor quality image. It is certainly going to be difficult to produce that in evidence because there would be some conjecture about what that image actually depicted, and certainly there would be some difficulty in the expert giving a rational position based on what they could see.<sup>19</sup>

4.16 Assistant Commissioner Barrie held the view that by considering business as usual and once-in-a-generation events, the ACMA had excluded events that occur in between. He maintained that it is the response to all of the events that occur 'in between' that provides the evidence to support the consistent argument of the police force sustained over the past three years that PSAs require 20 MHz to be able to respond.<sup>20</sup>

4.17 The PFA argued that business-as-usual activities assume that only a limited number of police response teams and personnel are involved in communications, including between incident control centres and the incident site.<sup>21</sup> Yet, the business-as-usual mobile demands of PSAs will continue to grow as demand for the services of PSAs increase for reasons including population growth, increased adoption of mobile data services by PSAs and the evolution of PSA mobile broadband applications. The WA Government and other jurisdictions noted that this growth is reflected in international comparisons, particularly in the USA, Canada and parts of Europe.<sup>22</sup>

4.18 The jurisdictions argued that there will be a natural growth in the number of PSA units as Australia's population grows and demand for public safety services subsequently increases.<sup>23</sup> In the ten years to 30 June 2007, the average annual population growth rate in Australia was 1.4 per cent while in the 2011–12 financial year, Australia's population increased by 1.6 per cent to approximately 22.68 million.<sup>24</sup> The Australian Bureau of Statistics projects that by 2026, the Australian population will have grown to between 25.9 million and 28.7 million.<sup>25</sup>

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19 Assistant Commissioner Peter Barrie, NSW Police Force, *Committee Hansard*, 17 June 2013, p. 15.

20 Assistant Commissioner Peter Barrie, NSW Police Force, *Committee Hansard*, 17 June 2013, pp 15–16.

21 Police Federation of Australia, *Submission 2*, p. 6.

22 Western Australian Government, *Submission 4*, p. 1; ACT Government, *Submission 12*, p. 1; Victorian Government, *Submission 15*, p. 1; NSW Government, *Submission 16*, p. 1.

23 Western Australian Government, *Submission 4*, Attachment 2, p. 6.

24 Western Australian Government, *Submission 4*, Attachment 2, p. 6.

25 Australian Bureau of Statistics cited in Western Australian Government, *Submission 4*, Attachment 2, p. 6.

4.19 While the size of PSAs will grow to meet the needs of the growing Australian population, respective Australian governments may also create new PSAs (in the future) which will need access to the PSMB network.

#### *Development of PSMB applications and capabilities*

4.20 Law enforcement and other PSAs are in the early stages of mobile broadband use. Growth factors not only include increasing demand for public safety services but also the take-up of mobile data services as well as the development of new PSMB applications for law enforcement and other emergency services.<sup>26</sup> Gibson Quai-AAS noted that once new mobile data services become available in operational environments, 'the demand increases rapidly and often significantly exceeds the original estimates of demand'.<sup>27</sup> Similarly, Mr Greg Bouwmeester, Southern Area Sales Manager of Motorola Solutions, explained that a 2012 practical demonstration of spectrum capacity set up by Motorola and the Western Australian Police in Perth proved that once PSAs have the opportunity to see what the technology was capable of, and to look at the applications, their understanding and appreciation of how such capabilities could operate in real circumstances 'tended to evolve and change'.<sup>28</sup> Mr Hewitt of the NCCGR further observed that while extensive modelling and engineering can be carried out, it was not until PSAs are in the field that they discover that they have inadequate bandwidth.<sup>29</sup>

4.21 In their joint submission to the SCPEM and the ACMA in February 2013, the states and territories noted that the data demand figures considered by the ACMA were estimates derived from data provided by PSAs in 2011 which projected their operational requirements for mobile broadband to 2020. The Gibson Quai-AAS report, which drew on the evidence provided by the PSAs, recognised that PSAs were in the early stages of developing operational models and business plans that can leverage off the capabilities of mobile broadband services and particularly services such as video.<sup>30</sup> As these projections were likely to evolve and change over time, Gibson Quai-AAS noted that such changes should be taken into account.<sup>31</sup>

4.22 Consideration of projected demand was noted by a 2011 Canadian study which projected public safety data demand 20 years ahead. The study's authors argued

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26 Police Federation of Australia, *Submission 2*, p. 5.

27 Gibson Quai-AAS Consulting, *Public Safety Mobile Broadband Demand Requirements*. For Public Safety Mobile Broadband Steering Committee, Final Report, November 2011, p. 26, [http://www.dbcde.gov.au/\\_data/assets/pdf\\_file/0007/148777/A024-2012\\_-\\_Document\\_1.pdf](http://www.dbcde.gov.au/_data/assets/pdf_file/0007/148777/A024-2012_-_Document_1.pdf) (accessed 10 July 2013).

28 Mr Greg Bouwmeester, Motorola Solutions, *Committee Hansard*, 24 June 2013, p. 31.

29 Mr Jim Hewitt, NCCGR, *Committee Hansard*, 24 June 2013, p. 35.

30 Gibson Quai-AAS Consulting, *Public Safety Mobile Broadband Demand Requirements*. For Public Safety Mobile Broadband Steering Committee, Final Report, November 2011, p. 26.

31 Gibson Quai-AAS Consulting, *Public Safety Mobile Broadband Demand Requirements*. For Public Safety Mobile Broadband Steering Committee, Final Report, November 2011, p. 2.



that 10 + 10 MHz was insufficient to support the needs of PSAs in the ten to fifteen year horizon.<sup>32</sup> It was observed that:

The result of the modeling, taking into account uncertainty factors, shows that the amount of bandwidth required to satisfy the needs of public safety to conduct their missions during commonly re-occurring major emergency situations with modern tools and applications is greater than 20MHz in the near-to-mid term, and likely to also exceed 20MHz in the long term, despite advances in technology. Clearly even with the full 10 + 10 MHz allocated, the community will need to take measures to efficiently manage broadband data communications carefully during periods of peak demand.<sup>33</sup>

4.23 Mr Tony Sheehan, Deputy Secretary of the AGD acknowledged the difficulties in judging what further efficiencies will be achieved in 2015–16 through the lens of 2012–13 technology.<sup>34</sup> Similarly, Mr Keith Besgrove, First Assistant Secretary, DBCDE explained that:

The whole purpose of this work is to develop a future capability that does not currently exist in Australia.<sup>35</sup>

4.24 In an article in *CommsWire* dated 14 March 2013, Mr Graeme Philipson stated that a 'consensus is emerging' that the allocation of 10 MHz of bandwidth in the ACMA's spectrum allocation is 'insufficient' for Australia's emergency services. He argued that more will be needed to handle new applications such as predictive policing which rely on large volumes of data (called Big Data) and high bandwidth applications such as video monitoring to work effectively. The article cites Motorola's Senior Vice President for Government, Mr Bob Schassler who stated that 20 MHz was needed to address the wireless data explosion in emergency services.<sup>36</sup>

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32 Defence Research and Development Canada – Centre for Security Science, *700 MHz Spectrum Requirements for Canadian Public Safety Interoperable Mobile Broadband Data Communications*, 28 February 2011, p. 46, <http://www.citig.ca/Data/Sites/1/action700/700mhztechnicalassessmentofpsrequirementsv09final!public.pdf> (accessed 11 July 2013).

33 Defence Research and Development Canada – Centre for Security Science, *700 MHz Spectrum Requirements for Canadian Public Safety Interoperable Mobile Broadband Data Communications*, 28 February 2011, p. iv.

34 Mr Tony Sheehan, AGD, *Committee Hansard*, 24 June 2013, p. 4.

35 Mr Keith Besgrove, DBCDE, *Committee Hansard*, 24 June 2013, p. 24.

36 Mr Graeme Philipson, 'Enough bandwidth for our emergency services?', *CommsWire*, 14 March 2013, p. 3, [http://dpl/Ejournals/CommsWireDaily/No.953\\_14March2013.pdf](http://dpl/Ejournals/CommsWireDaily/No.953_14March2013.pdf) (accessed 4 June 2013).

4.25 Mr Schassler was quoted as stating that:

We see a tenfold increase in bandwidth growth in emergency services in the next few years. Public safety and emergency services have a very different usage profile than most other users of high bandwidth. There are hotspots geographically and peaks by time, both of which vary enormously. And upload is as important as download.<sup>37</sup>

4.26 Deputy Commissioner Phelan of the AFP also emphasised that the growth of PSA requirements in terms of use of broadband spectrum in the future has the potential to reach well beyond the capacity of a 10 + 10 MHz spectrum provision. He explained that:

The amount of information that is going to be available to us in terms of the size of files, the amount of information that is available to transmit, we will need that capability into the future, and if we do not take the opportunity to harvest it now we will be back here in five years time asking someone else to reharmonise another spectrum again so we can find some spectrum just so we can keep the country safe. It seems to me that while we have the opportunity we should be doing it now.<sup>38</sup>

4.27 The joint states and territories submission to the SCPEM and the ACMA also highlighted the evolution of PSA mobile broadband applications and their associated usage. In 2011, the ACMA estimated that between 2007 and 2014, there would be a 30-fold increase in mobile broadband demand in Australia.<sup>39</sup> Drawing on this evidence, the states and territories argued that the PSA's business-as-usual demand profile could increase at the same rate as that for the commercial sector. Moreover:

Even a modest sustained growth rate in data demand would impact on the adequacy of the ACMA's PSMB spectrum decision for PSAs' future needs. If, for example, PSAs' business-as-usual demand profiles increases by 5 per cent per annum, LTE technology advances are unlikely to keep pace with such growth year on year and future bandwidth allocation will be necessary.<sup>40</sup>

4.28 In terms of the rapid growth and usage of mobile technology, Ericsson stated that globally, the number of mobile broadband subscriptions had grown by an estimated 45 per cent over the past twelve months, amounting to around 1.7 billion at present. Furthermore, mobile broadband continues to drive strong traffic growth with mobile data expected to grow at a compound annual growth rate of approximately 50 per cent which will mean that data will grow by twelve times between 2012 and 2018.<sup>41</sup> This evidence was supported by a Deloitte study which noted that the demand

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37 Mr Bob Schassler cited in Mr Graeme Philipson, 'Enough bandwidth for our emergency services?', *CommsWire*, 14 March 2013, p. 4, [http://dpl/Ejournals/CommsWireDaily/No.953\\_14March2013.pdf](http://dpl/Ejournals/CommsWireDaily/No.953_14March2013.pdf) (accessed 4 June 2013).

38 Deputy Commissioner Michael Phelan, AFP, *Committee Hansard*, 17 June 2013, p. 18.

39 The ACMA cited in Western Australian Government, *Submission 4*, Attachment 2, p. 7.

40 Western Australian Government, *Submission 4*, Attachment 2, p. 7.

41 Ericsson, *Submission 3*, p. 3.

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for bandwidth will be tested further by exponential growth rates in mobile data usage across the community and the PSAs.<sup>42</sup>

4.29 Orange Horizons Pty Ltd made the point that while the PSAs have not had experience with the facilities offered by mobile broadband and or any substantive understanding of how it will be used in the future, public carriers have been forecasting on their predicted needs for years. According to Orange Horizons, however, each time they prepare forecasts of usage they have found that the actual demand has far exceeded their initial estimates and that there is no reason to believe that the situation will be different with emergency services.<sup>43</sup> At the same time, Orange Horizons noted that present estimates of usage are most likely to be 'well short' of the actual requirements in the years to come'. Furthermore:

It would be a very short-sighted view to limit the amount of spectrum to the proposed 2 x 5 MHz blocks based on meeting current usage without having sufficient spectrum in reserve to meet actual demands in the future; this decision could have a serious impact on future emergency management capabilities.<sup>44</sup>

4.30 As the applications field is very fluid and as the PSMB networks are installed around the world, more specific applications will become available, many of which will involve actual users influencing the software and its effects.<sup>45</sup> Ericsson noted in this regard that LTE is the first truly global mobile technology and has achieved vast global scale in a few short years since being launched in Norway and Sweden in December 2009. According to Ericsson, it is widely acknowledged that 'LTE is the fastest growing ecosystem, ever'.<sup>46</sup>

4.31 Mr Hewitt of the NCCGR highlighted the rapid changes in demand for data by drawing on the example of hard drives whereby 20 years ago, the expectation was that 'we would never fill one meg hard drive' and yet now terabytes are sitting on our personal computers.<sup>47</sup> He noted that a similar phenomenon has taken place with regard to data series on mobile phones and so:

Once people understand what they can do with this technology, and the fact that they have a bearer they can use, applications will start popping up all over the place and they will chew the capacity up quickly.<sup>48</sup>

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42 Deloitte, Emergency Services Long Term Strategic Plan. International Public Safety Broadband, 23 February 2013, p. 2 available as NSW Government, *Submission 16*, Attachment 2, p. 2.

43 Orange Horizons Pty Ltd, *Submission 1*, p. [2].

44 Orange Horizons Pty Ltd, *Submission 1*, p. [2].

45 Orange Horizons Pty Ltd, *Submission 1*, p. [4].

46 Ericsson, *Submission 3*, p. 10.

47 Mr Jim Hewitt, NCCGR, *Committee Hansard*, 24 June 2013, p. 37.

48 Mr Jim Hewitt, NCCGR, *Committee Hansard*, 24 June 2013, p. 37.

4.32 The Association of Public-Safety Communications Officials (APCO) Australasia expressed the view that the communications capability of the general public has, for the first time, exceeded that of the PSAs largely on the basis of the availability of broadband technologies and a willingness to exchange information through various channels on a 'real time always connected basis'. APCO Australasia further highlighted that the environment was one in which the rate of change in technologies, need to share infrastructure and risk allocation as well as the potential use of different procurement models and need to at least keep pace with the communication capabilities of the public will have an impact on the PSAs and their budgets which is yet to be determined.<sup>49</sup> Similarly, Mr Schassler of Motorola Solutions was cited as acknowledging that once the bandwidth was allocated, it can never be taken back while:

As it is, at the moment our kids have better technology than our emergency services. We need to prioritise public safety, and make sure it doesn't miss out on the mobile and Big Data revolution. Every dollar spent on public safety returns five dollars to the community.<sup>50</sup>

### ***Major urban incidents and 'once-in-a-generation' events***

4.33 Submitters voiced concern with the ACMA's analysis of major urban incidents and 'once-in-a-generation' events. In particular, they pointed to the increasing frequency of natural disaster and growing terrorism threat. The WA Government, for example, asserted that spectrum allocation must take into account demand for major urban incidents including the likelihood of a major urban incident such as a terrorist attack, natural disaster (particularly given the growing frequency of such events) or security operation for an international event.<sup>51</sup> The WA Government argued that the ACMA did not provide sufficient spectrum for these types of events on the basis that it is not appropriate to provide high value spectrum for 'rare' contingencies. However, many state and territory jurisdictions did not support the ACMA's view that such incidents were rare contingencies or once-in-a-generation events.<sup>52</sup> The joint February 2013 submission of states and territories requested that the ACMA revisit its assessment and consider further evidence in relation to natural disasters, terrorist attacks, security operations for international events, and small and medium-scale incidents.<sup>53</sup>

4.34 Evidence also suggested that, what ACMA considered once-in-a-generation events, in fact occur far more frequently. The National Strategy for Disaster Resilience highlighted that Australian communities face devastating losses caused by

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49 APCO Australasia, *Submission 5*, pp 3–5.

50 Mr Bob Schassler cited in Mr Graeme Philipson, 'Enough bandwidth for our emergency services?', *CommsWire*, 14 March 2013, p. 4, [http://dpl/Ejournals/CommsWireDaily/No.953\\_14March2013.pdf](http://dpl/Ejournals/CommsWireDaily/No.953_14March2013.pdf) (accessed 4 June 2013).

51 Western Australian Government, *Submission 4*, p. 2.

52 Western Australian Government, *Submission 4*, p. 2.

53 Western Australian Government, *Submission 4*, Attachment 2, p. 8.

disasters every year.<sup>54</sup> COAG's National Disaster Resilience Statement of December 2009 noted the 'increasing regularity and severity of natural disasters'.<sup>55</sup> Furthermore, the National Framework to Improve Government Radiocommunications Interoperability endorsed by COAG, noted that the 'impacts of climate change and the continuing threat of terrorism are likely to increase the trend towards inter-jurisdictional operations'.<sup>56</sup> In support of this finding, the AGD noted that in the fifteen years since 1994, inter-jurisdictional responses had been required on average every 2.5 years.<sup>57</sup>

4.35 The PFA and the NSW Police Force observed that the once-in-a-generation scenario has already taken place six times in the last four years.<sup>58</sup> This evidence was also supported by Deloitte which noted that research has shown that large scale disasters are no longer once-in-a-generation events, but rather 'growing in frequency and severity'.<sup>59</sup> During various natural disasters which occurred between November 2010 and February 2011, more than 99 per cent of Queensland was disaster-declared while all other states and the Northern Territory experienced severe weather events or other natural disasters such as bushfires.<sup>60</sup> According to the joint states and territories submission to the SCPEM and the ACMA:

The evidence of increasing frequency and severity of natural disasters appears to be at variance with the ACMA's assessment that demand profiles for such incidents should be excluded from 800 MHz band decisions as such events might only occur in major urban areas "once in a generation".<sup>61</sup>

4.36 In relation to terrorism, the Australian Government has recognised the threat of terrorism as a persistent and permanent feature of Australia's security

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54 Council of Australian Governments, *National Strategy for Disaster Resilience*, February 2011, Foreword, p. iii, <http://www.em.gov.au/Documents/1National%20Strategy%20for%20Disaster%20Resilience%20-%20pdf.PDF> (accessed 19 June 2013).

55 Council of Australian Governments, *National Strategy for Disaster Resilience*, February 2011, p. iv, <http://www.em.gov.au/Documents/1National%20Strategy%20for%20Disaster%20Resilience%20-%20pdf.PDF> (accessed 19 June 2013).

56 *National Framework to Improve Government Radiocommunications Interoperability, 2010–2020*, National Coordinating Committee for Government Radiocommunications, 2009, p. 2, <http://www.em.gov.au/Documents/Nationa%20Framework%20to%20Improve%20Government%20Radiocommunications.pdf> (accessed 19 June 2013).

57 Mr Tony Sheehan, AGD, *Committee Hansard*, 24 June 2013, p. 1.

58 Mr Vince Kelly, PFA, *Committee Hansard*, 17 June 2013, p. 5; Assistant Commissioner Peter Barrie, NSW Police Force, *Committee Hansard*, 17 June 2013, p. 15.

59 Deloitte, *Emergency Services Long Term Strategic Plan, International Public Safety Broadband*, 26 February 2013, p. 1. Available as NSW Government, *Submission 16*, Attachment 2.

60 Western Australian Government, *Submission 4*, Attachment 2, p. 9.

61 Western Australian Government, *Submission 4*, Attachment 2, p. 9.

environment.<sup>62</sup> The 2013 National Security Strategy identified terrorism as a 'persistent threat' and key national security risk.<sup>63</sup> According to the Victorian Government, ACT Government and other states, however, the threat assessments and respective investment in counter-terrorism capability development and maintenance by Australian governments 'appears inconsistent with the ACMA's determination that it would be inappropriate to provide high value spectrum' for these worst case events.<sup>64</sup> The jurisdictions further noted that there are other security-related tasks which are expected to impose high demands on mobile broadband including the future G20 security operation. They argued that while it is possible to provide for such events through 'detailed planning and engagement with commercial carriers', an appropriately resourced PSMB network will reduce the reliance upon commercial carriers to 'deploy additional infrastructure to meet demand and mitigate the associated operational risks'.<sup>65</sup>

4.37 The jurisdictions also raised concern that by not considering large-scale incidents, the ACMA had 'effectively disregarded' the demand profiles of small and medium-scale incidents as the revised upper demand limit became those of the business-as-usual and planned event demand profiles. They noted in this regard that:

The demand profiles for small and medium-scale incidents are expected to exceed those of business-as-usual operations but to be less than those of large-scale incidents (i.e. a middle range). Additional data demand of planned events will be able to be more readily addressed through pre-deployment of COWS than is possible during emergencies. The omission of these demand profiles is of concern to jurisdictions as small and medium-scale incidents regularly occur—for example, PSAs respond to numerous small-scale emergencies each year.<sup>66</sup>

4.38 The NSW Police Force explained that this will significantly restrict the capacity of operational communications in responding to a range of common scenarios in a timely and effective manner.<sup>67</sup> To support their argument further, the jurisdictions cited the findings of a 2011 Canadian PSMB study which concluded that, with spectral efficiency improvements, a 20 MHz allocation could be sufficient for a

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62 Australian Government, *Counter-Terrorism White Paper: Securing Australia—Protecting our Community*, 2010, Executive Summary, p. ii, [http://www.dpmc.gov.au/publications/counter\\_terrorism/docs/counter-terrorism\\_white\\_paper.pdf](http://www.dpmc.gov.au/publications/counter_terrorism/docs/counter-terrorism_white_paper.pdf) (accessed 8 July 2013).

63 Department of the Prime Minister and Cabinet, *Strong and Secure: A Strategy for Australia's National Security*, January 2013, pp i – ii, [http://www.dpmc.gov.au/national\\_security/docs/national\\_security\\_strategy.pdf](http://www.dpmc.gov.au/national_security/docs/national_security_strategy.pdf) (accessed 8 July 2013).

64 Victorian Government, *Submission 5*, Attachment 2, p. 11; ACT Government, *Submission 12*, Attachment 2, p. 11.

65 Western Australian Government, *Submission 4*, Attachment 2, p. 11; ACT Government, *Submission 12*, Attachment 2, p. 11; NSW Government, *Submission 16*, Attachment 1, p. 11.

66 Western Australian Government, *Submission 4*, Attachment 2, p. 12.

67 NSW Police Force, *Submission 17*, p. 1.



PSA response to small-scale incidents such as severe multi-vehicle accidents, train derailments and aircraft emergency landings.<sup>68</sup>

### **Motorola Solutions and Western Australia Police LTE mobile network**

4.39 As previously noted, the Gibson Quai-AAS report found that once new mobile data services become available in operational environments, 'the demand increases rapidly and often significantly exceeds the original demand estimates.'<sup>69</sup> In light of this evidence, the committee considered the importance of operational testing. It drew on the evidence from Motorola Solutions which, in cooperation with the Western Australian Police, established a single-site LTE mobile network in Perth in mid-2012.

4.40 Motorola secured a temporary licence for the 700 MHz spectrum band from North America in Midland, Perth to run a field demonstration of its emergency service network equipment. Motorola Solutions explained that as PSAs were still trying to understand the usability of the technology, what it enabled and how it could be used in an operational sense, the demonstration provided an opportunity to set up a live network to run scenarios with equipment based on input given from PSAs.<sup>70</sup> The emergency scenarios including bush fires, floods, car accidents and other incidents and the staged area was approximately 1.5 kilometres from the site (or tower) because it represented the middle of the cell coverage, a typical type of scenario rather than on the edge of the cell coverage under the maximum bandwidth.<sup>71</sup>

4.41 Mr Greg Bouwmeester, Southern Area Sales Manager for Motorola Solutions explained the tests:

We ran a number of predictions based on the site in Mainlands, which were run both at 10 megahertz and at five megahertz. It was operated at a particular loading. The assumption on those plots is that you are constantly streaming data at about 700 kilobits per second—the sort of bandwidth you would require when transmitting video. We were able to demonstrate running that video at the various bandwidths. What you find is that when you switch from a 10 megahertz bandwidth—or a 10 plus 10, a 20 megahertz; I need to be careful with my terminology here—you have a bigger pipe. You can send more data. In the last scenario we ran, which was a multi-agency scenario, where we had video going between police, fire and ambulance, when we chose to switch it down to five megahertz, effectively the capacity dropped down and you started having images freezing or not coming through.<sup>72</sup>

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68 Western Australian Government, *Submission 4*, Attachment 2, p. 12.

69 Gibson Quai-AAS Consulting, *Public Safety Mobile Broadband Demand Requirements*. For Public Safety Mobile Broadband Steering Committee, Final Report, November 2011, p. 26, [http://www.dbcde.gov.au/data/assets/pdf\\_file/0007/148777/A024-2012\\_-\\_Document\\_1.pdf](http://www.dbcde.gov.au/data/assets/pdf_file/0007/148777/A024-2012_-_Document_1.pdf) (accessed 10 July 2013).

70 Mr Greg Bouwmeester, Motorola Solutions, *Committee Hansard*, 24 June 2013, p. 28.

71 Mr Greg Bouwmeester, Motorola Solutions, *Committee Hansard*, 24 June 2013, p. 28.

72 Mr Greg Bouwmeester, Motorola Solutions, *Committee Hansard*, 24 June 2013, p. 28.

4.42 ZDNet reported that:

In a single scenario, the company demonstrated multiple users accessing varying degrees of video streaming from different locations over an LTE network. With more users on the network, congestion became a major issue.

For this reason, the company said that, not only should emergency services have their own dedicated network, it should also utilise 20MHz of spectrum (as has been done in the US) rather than just 10MHz.<sup>73</sup>

4.43 Motorola Solutions noted that where PSAs are trying to run video and related applications either greater bandwidth or more sites is required. However, Mr Bouwmeester explained that:

By having a 10 plus 10, you have access to that bandwidth and you can actually achieve these things. If you reduce to five plus five, either you will not get the bandwidth through or you will have to put more sites in.<sup>74</sup>

4.44 Mr Bouwmeester also noted that if an incident is in a localised area then having multiple sites does not necessary provide greater capacity if PSAs are accessing only one site. He asserted that where fifteen agencies or applications are accessing one site, whether or not they have another site next door makes no difference, as they are still limited in the capacity that they can use.<sup>75</sup>

4.45 The PFA provided four maps of the exercise.<sup>76</sup> Maps 1 and 2 depicted 20 subscribers and 15 subscribers at 5 MHz + 5 MHz whereas maps 3 and 4 depicted 20 and 15 subscribers at 10 + 10 MHz. Mr Waites of the PFA explained that 20 subscribers is not unusual for a major traffic accident. For example, police, fire and ambulance officers will attend an accident such as the rollover of a petrol tanker or chemical tanker. During such an event, 20 first responders will be trying to access data from their own service databases (or gazeteer) which contain relevant information such as maps, details about chemicals, utilities and related matters which are required to respond effectively and safely. The maps revealed that a total of 20 MHz (10 + 10 MHz) makes what Mr Waites described as a 'massive difference' to those responding, both in the area of coverage and in terms of the power of coverage.<sup>77</sup>

4.46 The demonstrations revealed a 'noticeable jump in quality' when public safety agencies were allocated a 10 MHz + 10 MHz chunk of bandwidth, as opposed to 5 MHz + 5 MHz. Of the results, Mr Starr argued that:

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73 Josh Taylor, 'Motorola pushes for extra spectrum for emergency services, *ZDNet*, 11 October 2012, <http://www.zdnet.com/au/motorola-pushes-for-extra-spectrum-for-emergency-services-7000005649/> (accessed 31 May 2013).

74 Mr Greg Bouwmeester, Motorola Solutions, *Committee Hansard*, 24 June 2013, p. 28.

75 Mr Greg Bouwmeester, Motorola Solutions, *Committee Hansard*, 24 June 2013, p. 28.

76 Police Federation of Australia, Additional information received at 17 June 2013 public hearing, [http://www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Committees?url=le\\_ctte/spectrum\\_mobile\\_broadband/submissions.htm](http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Committees?url=le_ctte/spectrum_mobile_broadband/submissions.htm).

77 Mr Robert Waites, PFA, *Committee Hansard*, 17 June 2013, p. 3.



A purpose-built broadband network gives the coverage and capacity required, but also the ability to control and prioritise traffic.<sup>78</sup>

4.47 Motorola Solutions has consistently argued that the 700 MHz spectrum should be reserved for public safety organisations as video streaming becomes increasingly important for dealing with crisis situations.<sup>79</sup>

### ***Resourcing law enforcement***

4.48 Evidence to the committee from law enforcement underscored the importance of accessing accurate, timely and coherent audio and visual information. This concern was clearly demonstrated in two images provided by Motorola Solutions (below). The images reveal the difference between 10 and 20 MHz from the perspective of law enforcement operations.

***Figure 4.1: 10 MHz of Spectrum and 20 MHz of Spectrum***



*Source: Motorola Solutions, Submission 10, p. [5].*

78 Mr Gary Starr cited in Brett Winterford, 'Five-year delay on 800 MHz emergency networks', *itnews*, 12 October 2012.

79 Spandas Lui, 'Motorola: Save the 700 MHz spectrum for public safety', *Australian Reseller News*, 2 March 2011, [http://www.arnnet.com.au/article/378447/motorola\\_save\\_700mhz\\_spectrum\\_public\\_safety/](http://www.arnnet.com.au/article/378447/motorola_save_700mhz_spectrum_public_safety/) (accessed 5 June 2013).

4.49 Mr Bouwmeester from Motorola Solutions explained that the quality of the image will dependent on bandwidth and data throughput. Furthermore:

The best way to explain the five versus 10 is in relation to the size of a pipe that you can put stuff down. If you have a pipe of a particular size and you have full access to that, yes, you can put high-quality video or image through. The reality, in the real world, is that you do not have one single user on a pipe; you have multiple users. The demonstration there was to say: if I had a pipe of a defined size—let us say it was a five-megahertz pipe—and I had lots of data going through it and I wanted to try and transmit that image, in five megahertz, because I am restricted by that pipe, I can only get that sort of resolution. If I had a bigger pipe, I could send a higher resolution image.<sup>80</sup>

4.50 Mr Bouwmeester noted that regardless of the size of the pipe, it can overload and overflow will occur and users may be kicked off. The underlying premise, however, is that if the pipe is small to start with then capacity will be exceeded significantly faster.<sup>81</sup>

4.51 Police agencies noted that the information provided of such a scene could be critical to determining how best to respond. Mr Waites from the PFA explained that the difference for policing operations between the two images was that of facial technology, the ability to identify the weapon as well as to recognise who had it and what they were doing with it. Mr Waites noted that:

The same sort of detail does not exist in the left-hand side. In fact, the left-hand side could be somebody doing anything. Unless you are already aware of some other information, you would not really be able to recognise exactly what that was, whereas on the right, you certainly can.<sup>82</sup>

4.52 Mr Waites further highlighted that access to such information would ensure that there was no 'unnecessary reaction in the wrong way'. Without the detail made available in the photograph on the right, it would be difficult to determine whether the most appropriate response would be immediate action rather than 'contain and negotiate'.<sup>83</sup>

### **Costs including infrastructure considerations**

4.53 Another matter considered by the committee was the costs associated with the decision to allocate 10 MHz rather than 20 MHz of spectrum. In particular, it was noted that there may be greater infrastructure costs associated with a 10 MHz allocation. For example, the NSW Police Force expressed concern that the ACMA's multi-layered proposal provides added capacity through additional infrastructure

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80 Mr Greg Bouwmeester, Motorola Solutions, *Committee Hansard*, 24 June 2013, p. 29.

81 Mr Greg Bouwmeester, Motorola Solutions, *Committee Hansard*, 24 June 2013, p. 29.

82 Mr Robert Waites, PFA, *Committee Hansard*, 17 June 2013, p. 3.

83 Mr Robert Waites, PFA, *Committee Hansard*, 17 June 2013, p. 3.

which is costly and inconsistent with the operating environment of public safety agencies.<sup>84</sup>

4.54 In their joint submission to the SCPEM and the ACMA of February 2013, the ACT, NSW, Queensland, South Australia, Victoria and WA governments noted that, in relation to the option of network 'densification', there would be a significant cost trade-off in designing, building and operating a PSMB 10 MHz spectrum network compared to a network on a greater allocation of spectrum.<sup>85</sup> The jurisdictions argued that the estimated increase in network costs (to achieve equivalent capacity with a network dimensioned on 20 MHz of spectrum) is likely to be substantially more than the commercial value of the additional spectrum and would represent a significant cost shift from the Commonwealth to the states and territories.<sup>86</sup>

4.55 Evidence from the Western Australian Government estimated an increase in capital and operating costs to provide, in the greater central business district area only, comparable total data capacity through a 10 MHz network rather than a 20 MHz network. The jurisdictions provided the following indicative cost differentials to make the point while noting that they are subject to refinement following further planning.

**Figure 4.2: Indicative cost differentials over 15 years – selected jurisdictions**

Jurisdiction	Indicative cost differential over 15 years (increase in costs for a 10 MHz network in comparison with a 20 MHz network)
ACT	40 per cent – 50 per cent
NSW	23 per cent
Queensland	25 per cent – 50 per cent
WA	20 per cent

Source: Western Australian Government, *Submission 4*, Attachment 2, p. 16.

4.56 The jurisdictions further explained that the indicative cost differentials for a 10 MHz network do not necessarily assume that jurisdictions will attain an equivalent data capacity throughout the entire coverage area to that of a 20 MHz network. They argued that to achieve an equivalent data capacity, the number of network sites would have to be approximately doubled and additional costs could be greater.<sup>87</sup>

4.57 Mr Sheehan of the AGD acknowledged that the potential for greater costs in the construction of a dedicated capability in relation to a 10 MHz spectrum allocation

84 NSW Police Force, *Submission 17*, p. 1.

85 Public Safety Mobile Broadband, Joint States and Territories Submission to the SCPEM and the ACMA, Further Evidence from Jurisdictions, February 2013 submitted as Western Australian Government, *Submission 4*, Attachment 2, pp 5 and 16.

86 Western Australian Government, *Submission 4*, Attachment 2, p. 5.

87 Western Australian Government, *Submission 4*, Attachment 2, pp 16–17.

as opposed to 20 MHz was understood but noted that the ACMA was best placed to canvas cost questions.<sup>88</sup>

4.58 The ACMA recognised that as a spectrum allocation grows, fewer base stations are needed. At the same time, however, it highlighted that as high value spectrum below 1 GHz is scarce, a trade off where spectrum is sacrificed to save on infrastructure should be avoided.<sup>89</sup> Furthermore, the ACMA highlighted that:

...the argument that spectrum and cell size can be traded against each other only applies to appropriate *dense* network topologies, ie. networks with reasonably closed spaced base stations, and not...large cell typology.<sup>90</sup>

4.59 However, the states and territories held the view that the estimated increase in network costs (to achieve equivalent capacity with a network dimensioned on 20 MHz of spectrum) is likely to be 'substantially more than the commercial value of the additional spectrum' which would represent a 'significant cost shift from the Commonwealth to the States and Territories'.<sup>91</sup> In terms of costs, Ericsson noted that the construction of physical infrastructure by way of towers and the sites themselves represent 80 per cent of the overall radio network costs compared to the 20 per cent on equipment.<sup>92</sup> According to the jurisdictions, an approach requiring greater infrastructure density is suitable for market-oriented organisations such as commercial carriers which generate financial profits from their use of spectrum which can be reinvested in additional infrastructure and whose networks are designed for average usage throughout the network. In contrast, PSAs are focused on providing public services in order to protect lives and property and require, according to the jurisdictions, networks designed for peak usage in concentrated areas with a critical grade of service that exceeds that of commercial entities. Furthermore:

PSAs do not generate profits that can be reinvested in additional infrastructure. Any additional investment would need to come from State and Territory Governments and would involve diverting investment away from other community services that also produce a public benefit.<sup>93</sup>

4.60 The ACMA is reported to have advised the PSAs that in order to ensure the data capacity required to support operations on a 10 MHz spectrum allocation, owners will need to increase the density of their fixed network sites and that a balance between the size of spectrum allocations and infrastructure investments is required.<sup>94</sup> The joint submission of the states and territories recognised, however, that any approach requiring greater infrastructure density would be better suited to commercial

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88 Mr Tony Sheehan, AGD, *Committee Hansard*, 24 June 2013, p. 4.

89 Australian Communications and Media Authority, *Submission 7*, p. [8].

90 Australian Communications and Media Authority, *Supplementary Submission 7*, p.[3].

91 Western Australian Government, *Submission 4*, Attachment 2, p. 5.

92 Ericsson, *Submission 3*, p. 10.

93 Western Australian Government, *Submission 4*, Attachment 2, p. 18.

94 Western Australian Government, *Submission 4*, Attachment 2, p. 14.

organisations which generate profit from their use of spectrum. Furthermore, while commercial networks are designed for average use throughout the network, PSA networks are designed for peak usage in concentrated areas.<sup>95</sup> The jurisdictions also noted that:

Across the same coverage area, increasing fixed infrastructure density with a 10 MHz allocation can result in a comparable total data capacity as a greater allocation (e.g., in comparison to a 20 MHz allocation, through the doubling of network sites). However, multiple PSA responders at the point of operational need in a specific cell (or part of the cell) will not necessarily have access to the equivalent level of data capacity as they would with a greater spectrum allocation.<sup>96</sup>

4.61 According to the jurisdictions, the Gibson Quai-AAS spectrum calculations across all demand profiles assume that PSA responders and demand were evenly distributed across the coverage area. However, the operational experience of PSAs indicates that responders more commonly operate in a cluster or series of clusters around the most critical point(s) of response. During mission-critical operations where the primary response of PSAs is concentrated around a relatively small area such as a train crash site, a greater allocation of spectrum is likely to better meet the operational needs of PSAs even if the infrastructure density has been increased. To achieve the equivalent total data capacity as a 20 MHz network site, two 10 MHz sites covering the same area would be required. According to the jurisdictions:

This would however, mean that the total data capacity is divided between 6, as opposed to 3, cell sectors, which reduces the amount of data accessible by responders at any given point. From a PSMB network perspective the clustering of responders around the incident site may well occur within a single cell sector—if this does occur responders could have immediate access to only 50 per cent of the data capacity with a 10 MHz network compared to a 20 MHz network.<sup>97</sup>

4.62 Motorola Solutions made the point that while additional towers involve costs, there are other considerations including environmental impact as the community will resist densely populated towers.<sup>98</sup> Moreover, Motorola noted that if 5 + 5 MHz were allocated to PSAs, as a technology manufacturer, the company would actually sell more equipment.<sup>99</sup>

4.63 The PFA argued that, while the Radiocommunications Act requires the ACMA to consider the needs of PSAs for the mission critical work they perform to protect life and property in times of disaster and emergencies, it is exactly when their

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95 Western Australian Government, *Submission 4*, Attachment 2, p. 5.

96 Western Australian Government, *Submission 4*, Attachment 2, p. 14.

97 Western Australian Government, *Submission 4*, Attachment 2, p. 14.

98 Mr Paul Thompson, Motorola Solutions, *Committee Hansard*, 24 June 2013, p. 29.

99 Mr Greg Bouwmeester, Motorola Solutions, *Committee Hansard*, 24 June 2013, p. 29.

needs are most acute in the performance of this function that the spectrum proposed will be half of what is needed.<sup>100</sup> The PFA further argued that:

We believe that it is precisely the PSA needs in time of emergencies and natural disasters that the Act is directed at, and where the ACMA proposal falls seriously short.<sup>101</sup>

4.64 Similarly, the Victorian Government, NSW Government, ACT Government and WA Government argued that due consideration should be given to the concerns of jurisdictions when the overall value of spectrum for PSMB is calculated. Such concerns include:

- the higher level of operational risks to PSAs should spectrum allocation be insufficient;
- the opportunity costs of additional investments by state and territory governments in building a PSMB capability with a lower spectrum allocation; and
- the public safety benefit that a PSMB capability will provide to all Australians.<sup>102</sup>

4.65 Another matter raised during the inquiry which was the subject of competing claims was that of contiguous spectrum. Mr Hewitt of the NCCGR informed the committee that contiguous spectrum was required by PSAs.<sup>103</sup> However, according to the ACMA, multi-carrier aggregation (notionally pairing a lower and higher band) is supported by the LTE standard. Yet, the ACMA noted that achieving multi-carrier aggregation would require 'additional complexity in the handset and base stations'.<sup>104</sup>

### **Extraordinary access to additional spectrum**

4.66 The ACMA raised the possibility of providing extraordinary access to additional spectrum under section 27 and Part 4.4 of the Radiocommunications Act. However, such a prospect raises questions regarding the resourcing of PSAs. The ACMA noted for example that under such an eventuality, PSAs would need to ensure that they have procured suitable equipment and infrastructure including handsets with appropriate chipsets and additional transmit and receive cards installed in base stations in order to enable the operation of additional spectrum.<sup>105</sup>

4.67 The jurisdictions and law enforcement agencies raised concerns that the extreme circumstances provisions in the Radiocommunications Act are untested and unlikely to be able to provide surge capacity in the first few hours of response to a

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100 Police Federation of Australia, *Submission 2*, p. 3.

101 Police Federation of Australia, *Submission 2*, p. 3.

102 Victorian Government, *Submission 15*, p. 2; NSW Government, *Submission 16*, p. 2; ACT Government, *Submission 12*, p. 2; Western Australian Government, *Submission 4*, p. 2.

103 Mr Jim Hewitt, NCCGR, *Committee Hansard*, 24 June 2013, p. 36.

104 Australian Communications and Media Authority, *Supplementary Submission 7*, p. 27.

105 Australian Communications and Media Authority, *Submission 7*, p. [6].

sudden-onset emergency when that capacity is most needed.<sup>106</sup> The NSW Police Force further noted that the legislative provisions are not a realistic mitigation strategy for addressing network capacity issues arising from periods of peak demand.<sup>107</sup>

### **International experience**

4.68 Motorola Solutions highlighted that the allocation of 20 MHz (10 + 10 MHz) is the standard globally while the PFA noted that 20 MHz for law enforcement is the prevailing minimum.<sup>108</sup> Similarly, Mr Hewitt of the NCCGR held that, based on overseas cases where such systems are currently being deployed, the universal understanding was that 20 MHz is the 'absolute minimum' that PSAs need to run a system effectively.<sup>109</sup> A number of European countries, for example, have concluded that a 10 MHz spectrum allocation will not provide sufficient bandwidth for incidents that occur on a daily basis and have either allocated or are considering the allocation of greater spectrum accordingly.<sup>110</sup> At the same time, it should be noted that countries such as the USA and Canada commenced with an allocation of 5 + 5 MHz for PSMB but had to revisit the allocation and provide a total allocation of 10 + 10 MHz 'based on subsequent analysis of operational requirements'.<sup>111</sup>

#### *United States*

4.69 Motorola Solutions noted that early in the development of LTE and a spectrum allocation to public safety organisations, the USA allocated what it thought to be an adequate amount of spectrum for LTE public safety broadband communications. The USA allocated 5 MHz (for uplink) + 5 MHz (for downlink). However, as the specifications for LTE were further developed and public safety agencies became more aware of the capabilities of LTE, the limitations of the 5 MHz + 5 MHz allocation became apparent.<sup>112</sup> Similarly, the PFA and various jurisdictions gave evidence that the allocated 10 MHz fell short of what they needed to communicate effectively.<sup>113</sup> According to Motorola Solutions, after years of lobbying,

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106 Western Australian Government, *Submission 4*, Attachment 2, p. 4; NSW Police Force, *Submission 17*, p. 3

107 NSW Police Force, *Submission 17*, p. 3.

108 Motorola Solutions, *Submission 10*, p. [4]; Police Federation of Australia, *Submission 2*, p. 4.

109 Mr Jim Hewitt, NCCGR, *Committee Hansard*, 24 June 2013, p. 35.

110 Deloitte, *Emergency Services Long Term Strategic Plan, International Public Safety Broadband*, 26 February 2013, p. 1. Available as NSW Government, *Submission 16*, Attachment 2.

111 Deloitte, *Emergency Services Long Term Strategic Plan, International Public Safety Broadband*, 26 February 2013, p. 1; Motorola Solutions, *Submission 10*, p. [4].

112 Motorola Solutions, *Submission 10*, p. [4].

113 Police Federation of Australia, *Submission 2*, p. 4; Western Australian Government, *Submission 4*, Attachment 2, p. 7.

an additional allocation for use by public safety agencies was provided with the USA allocating a total of 10 MHz + 10 MHz of spectrum to PSBB.<sup>114</sup>

4.70 However, evidence to the committee from the ACMA suggested that Australia differed to the USA, Europe and Canada in terms of population density and the number of first responders.<sup>115</sup> Mrs Cahill of the ACMA further argued that the approach taken in Australia and the model applied to identify the spectrum needs of PSAs is specific to Australian conditions which do not provide for like-for-like comparisons.<sup>116</sup> Yet, Orange Horizons challenged this evidence by noting that Australia's major cities rank in size as comparable to many of the larger cities in the United States which means that 'the demand for mobile broadband in our cities will be similar'. It noted that as data requirements are a result more of population density than national population, a similar location in Australia to the USA would be justified.<sup>117</sup> Orange Horizons stated that where Australia diverges from the USA is in relation to data usage given that in Australia, most jurisdictions are state-based, requiring the need for data to be shared over larger areas and provided to state operation centres. According to Orange Horizons, this wider area of operations will result in a higher data usage in many areas as it is operated in parallel with other operational areas and agencies.<sup>118</sup>

#### *Canada*

4.71 Canada is following the lead of the USA and allocated 5 + 5 MHz. An ensuing public safety campaign generated debate on increasing the allocation of an additional 5 MHz + 5 MHz. The conclusions of a paper developed by Defence Research and Development Canada indicated support for the allocation of 10 MHz + 10 MHz of 700 MHz spectrum for PSMB and the Canadian Government is currently considering a proposal to increase the allocation to 20 MHz.<sup>119</sup>

#### *Europe*

4.72 In Europe, a working group has been established under the European Conference of Postal and Telecommunications Administrations to consider the allocation of spectrum for public protection and disaster relief mobile broadband. According to the Western Australian Government, the working group concluded that a minimum of 15 MHz (7.5 + 7.5 MHz) was required for everyday scenarios with at least 20 MHz (10 + 10 MHz) necessary for large-scale planned events.<sup>120</sup> Motorola

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114 Motorola Solutions, *Submission 10*, p. [4].

115 Mrs Maureen Cahill, ACMA, *Committee Hansard*, 24 June 2013, p. 11.

116 Mrs Maureen Cahill, ACMA, *Committee Hansard*, 24 June 2013, p. 11. Mrs Maureen Cahill, ACMA, *Committee Hansard*, 24 June 2013, p. 11. Mrs Maureen Cahill, ACMA, *Committee Hansard*, 24 June 2013, p. 11.

117 Orange Horizons Pty Ltd, *Submission 1*, p. [2].

118 Orange Horizons Pty Ltd, *Submission 1*, p. [2].

119 Motorola Solutions, *Submission 10*, p. [4]; Western Australian Government, *Submission 4*, Attachment 2, p. 7.

120 Western Australian Government, *Submission 4*, Attachment 2, p. 7.



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Solutions noted that a separate study for the German Federal Ministry of Economics and Technology found that a spectrum allocation of 15 MHz + 10 MHz was needed.<sup>121</sup>

### **Committee view**

4.73 The committee acknowledges the concerns of a number of states and territories and their law enforcement bodies that if spectrum allocation is insufficient, there are high operational risks involved to PSAs which may impact the safety and security of the Australian public.<sup>122</sup> Conversely, the committee recognises the substantial public safety benefit that could be derived from a PSMB capability which is efficient and provides for all Australians. In this regard, the committee welcomes the comments from Mr Cheah of the ACMA that if the actual demand from a real world PSMB network proved to be materially higher than predicted then the ACMA would be prepared to reopen consideration of the issue.<sup>123</sup>

4.74 The committee appreciates that the ACMA undertook a process with PSAs in 2012 to identify their spectrum requirements. As part of this process, agreement was reached regarding the methodology that would be applied and PSAs contributed data to inform the process which led the ACMA to identify 10 MHz as sufficient in four out of five emergency scenarios.<sup>124</sup> However, the committee also recognises that the PSAs are in the early stages of developing systems and understanding their requirements in this fast growing area. Such developments have led various jurisdictions and law enforcement authorities to recognise that 10 MHz is inadequate for the purposes of responding to natural disasters and other emergencies in an effective and timely manner both now and into the future. As the ACMA consistently highlighted that it has taken an evidence-based approach<sup>125</sup> to determining the spectrum allocation requirements of PSAs in 2012, available evidence before the committee (which is also currently under the consideration of the ACMA) upholds a position underpinned by evidence that 10 MHz is inadequate and that at 20 MHz is the absolute minimum required.

4.75 The ACMA argued that the appropriate allocation of spectrum to PSAs does not constitute a once-in-a-lifetime opportunity because spectrum is repurposed every 15 years.<sup>126</sup> However, the committee recognises that the allocation of sufficient and appropriate spectrum to PSAs to enable the deployment and growth of a dedicated mission-critical mobile broadband capability is a once-in-a-lifetime opportunity. The risks of reverse engineering a solution based on the limited availability of spectrum

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121 Motorola Solutions, *Submission 10*, p. [4]; Western Australian Government, *Submission 4*, Attachment 2, p. 7.

122 Western Australian Government, *Submission 4*, p. 2.

123 Mr Chris Cheah, ACMA, *Committee Hansard*, 24 June 2013, p. 9.

124 Mr Chris Cheah, ACMA, *Committee Hansard*, 24 June 2013, p. 11.

125 ACMA, *Submission 7*, p. [5]; Mr Chris Cheah, ACMA, *Committee Hansard*, 24 June 2013, pp 8, 9, 11, 13.

126 Dr Andrew Kerans, ACMA, *Committee Hansard*, 24 June 2013, pp 13–14.

should be avoided. Such technology will underpin the next generation of policing operations into the next decade and beyond. To this end, the committee recognises that it is reasonable to expect that PSAs will require 20 MHz of spectrum to provide for a national PSMB network under a fifteen year licence. The committee recognises that 20 MHz of spectrum will meet current PSA requirements while providing for expected growth in and demand for PSAs services into the future.

4.76 Furthermore, in order to meet additional PSA demands for spectrum into the future, the committee takes the view that such agencies should be provided priority access to an additional 10 MHz spectrum for public safety purposes.

4.77 PSA priority access could be achieved through the introduction of a licence condition. Alternatively, contractual arrangements could be negotiated with the commercial purchaser or the provisions for declarations of emergency in the Radiocommunications Act may be relied upon.

# CHAPTER 5

## 800 MHz band v 700 MHz band

5.1 This chapter considers the evidence in relation to the 700 MHz band and 800 MHz band. In exploring the most appropriate band for public safety agencies, the chapter considers technical, cost, timeliness and risk factors, and contextualises international harmonisation efforts.

### Allocation of spectrum in the 800 MHz band

5.2 According to the ACMA, the original terms of reference for the PSMBSC established to consider spectrum requirements was to consider an 'allocation if needed from spectrum in the 800 megahertz'.<sup>1</sup> Mrs Cahill from the ACMA explained that the focus remained on the 800 MHz band for three reasons as follows:

First, because the technical characteristics of 800 are well suited to deployment required by public safety agencies. Secondly because the timing in terms of when it could be made available and the work that the ACMA was doing coalesced and it will be made available in the time that is needed for a roll-out. Thirdly, because it was identified as a potentially harmonised band in our region. So the actual terms of reference for the Public Safety Mobile Broadband Steering Committee, which has been in place since May 2011, have been focused on the 800 megahertz band.<sup>2</sup>

5.3 Dr Kerans from the ACMA went on to comment that the spectrum estimation was undertaken in the ACMA's Spectrum Planning Branch which is made up almost exclusively of engineers. He noted that the process entailed considering the data demand methodologies or the data flow required for the operational needs of PSAs and considering how much spectrum would be required. Dr Kerans elaborated that:

We did not at any time consider the commercial value of the spectrum we were allocating. At the moment in the spectrum that we are talking about—the 800-megahertz block—no decision on the allocation of that spectrum has been made. We have not finished the review of the 800 band yet. So, basically, a portion of that was set aside before any of those decisions were made, based purely on an engineering analysis of the data presented to us.<sup>3</sup>

5.4 However, the governments of WA, the ACT, Victoria and NSW held an alternative view on the allocation. They asserted that spectrum was both considered and offered in the 800 MHz band on the basis of the following three considerations:

- the importance of regional harmonisation as the 800 MHz band is being promoted in the Asia-Pacific region as the band for public protection and disaster relief;

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1 Mrs Maureen Cahill, ACMA, *Committee Hansard*, 24 June 2013, p. 17.

2 Mrs Maureen Cahill, ACMA, *Committee Hansard*, 24 June 2013, p. 17.

3 Dr Andrew Kerans, ACMA, *Committee Hansard*, 24 June 2013, p. 13.

- the commercial value of the 700 MHz band which was estimated by the ACMA to be valued at approximately 28 per cent higher per MHz than the 800 MHz band; and
- the assumption that there would be no 700 MHz band spectrum available following the April 2013 auction. However, as noted in Chapter 2, two paired 15 MHz segments, or 30 MHz in total, failed to sell and remain available in the 700 MHz band.<sup>4</sup>

5.5 Stakeholders also held differing views on how the commercial value of spectrum informed the decision making process. Telstra noted that the continuing growth in demand for commercial mobile broadband services was one of the reasons why spectrum in the 700 MHz band was not appropriate for a PSMB network.<sup>5</sup> Assistant Commissioner Peter Barrie of the NSW Police Force took the view that the work of the PSMBSC was restricted by a 'strategic view' of how the 700 MHz harmonised spectrum would be made available through auction. Furthermore, he argued that:

If you exclude that or take it off the table and look at opportunities in the 800 band, which is quite congested, there is a large portion of the 800 band that is currently used by the carriers that was specifically excluded from consideration. There is also a large number of incumbent users in that 800 band.

The difficulty then becomes, if senior officers have provided advice that public safety can be accommodated in the 800, going through a process which clearly defines what those requirements look like in terms of their capacity, and then finding that they are in a very difficult situation as to how they are going to achieve that.<sup>6</sup>

5.6 The NSW Police Force also argued that the focus had remained on satisfying the requirements of the ACMA to justify an appropriate allocation of spectrum rather than the development of the wider scope of requirements needed to develop and implement the information and communication technology required. It argued that such an approach had not afforded the PSAs the opportunity to draw on existing science and innovation capabilities as promoted in the National Security and Innovation Strategy.<sup>7</sup> Similarly, Mr Burgess of the PFA noted that as there was an expectation that the 700 MHz band spectrum would sell, the PSMBSC was set up on the basis of reviewing the 800 'because there was an expectation that there would be no 700 available'.<sup>8</sup>

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4 Western Australian Government, *Submission 4*, p. 3.

5 Telstra, *Submission 11*, p. 3.

6 Assistant Commissioner Peter Barrie, NSW Police Force, *Committee Hansard*, 12 July 2013, p. 12.

7 NSW Police Force, *Submission 17*, p. 4.

8 Mr Mark Burgess, PFA, *Committee Hansard*, 17 June 2013, p. 6.

## Technical differences

5.7 The DBCDE issued a fact sheet in December 2012 which stated that the spectrum in the 800 MHz band had almost identical characteristics to that of the 700 MHz band in terms of:

- data-carrying capacity and ability to support video applications;
- distance covered; and
- ability to penetrate buildings.<sup>9</sup>

5.8 Orange Horizons argued that from a technical viewpoint, the transmission characteristics are effectively the same for both the 700 MHz band and 800 MHz band as there is 'no technical advantage between them'.<sup>10</sup> Similarly, Ericsson noted that there was 'negligible difference in coverage characteristics' between the 700 and 800 MHz bands.<sup>11</sup> This evidence was supported by the ACMA which stated that the two bands have 'almost identical characteristics'.<sup>12</sup>

5.9 However, the PFA put a different view and stated that the 700 MHz band is the perfect spectrum for PSAs because it is not affected by atmospheric conditions.<sup>13</sup> Mr Waites from the PFA noted that the 700 MHz band was often called the 'sweet spot' by radio technicians for this reason.<sup>14</sup>

5.10 PSAs also raised concerns regarding penetration in relation to the ACMA's provision of spectrum in the 4.9 GHz band. This evidence was confirmed by Dr Kerans of the ACMA who acknowledged that the 4.9 GHz band does not have the same penetrating ability as that of the 700 or 800 MHz bands. However, he stated that it would be used to offload the data from the network that does have the penetration.<sup>15</sup>

## Costs differences and economies of scale

5.11 The committee received evidence from a number of states and territories which noted that provision of spectrum in the 700 MHz band is expected to reduce the costs of a PSMB network. The Western Australian Government stated that:

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9 Department of Broadband, Communications and the Digital Economy, Fact sheet 3: Public safety mobile broadband capability—700 MHz v 800 MHz—Suitability for Australian public safety use, December 2012, [http://www.dbcde.gov.au/\\_data/assets/pdf\\_file/0016/139120/Fact\\_Sheet\\_3\\_-\\_Dec\\_2012.pdf](http://www.dbcde.gov.au/_data/assets/pdf_file/0016/139120/Fact_Sheet_3_-_Dec_2012.pdf) (accessed 28 May 2013).

10 Orange Horizons Pty Ltd, *Submission 1*, p. [3].

11 Ericsson, *Submission 3*, p. 7.

12 Mr Chris Cheah, ACMA, *Committee Hansard*, 24 June 2013, p. 9.

13 Mr Robert Waites, Police Federation of Australia, *Committee Hansard*, 17 June 2013, p. 5.

14 Mr Robert Waites, Police Federation of Australia, *Committee Hansard*, 17 June 2013, p. 5.

15 Dr Andrew Kerans, ACMA, *Committee Hansard*, 24 June 2013, p. 15.

The reduction in cost is due to the 700 MHz band's ability to support commercially available public safety grade equipment and systems integration solutions (whereas the 800 MHz band currently does not).<sup>16</sup>

5.12 Similarly, in a joint letter to the Prime Minister of July 2012, the Premiers of NSW, Victoria, Queensland and Western Australia stated that the costs arising from building a capability on the 800 MHz spectrum would result in additional costs incurred by the jurisdictions, 'particularly to purchase and maintain equipment to establish a public safety capability on this spectrum'.<sup>17</sup>

5.13 The ACMA was of a different view, explaining that the only currently available equipment worldwide is for the USA band plan which both the USA and Canada have committed to.<sup>18</sup> However, the ACMA's Mrs Cahill argued that the move to harmonisation or a standardised approach in the Asia-Pacific region including 'potentially, for equipment to be standardised' would provide for economies of scale.<sup>19</sup>

5.14 There was considerable debate during the inquiry regarding harmonisation and its potential impact on economies of scale. Mr Abul Rizvi, Deputy Secretary of the DBCDE, acknowledged that the international community could be divided in terms of commercial production between the USA and Canada on the 700 MHz band and others, potentially countries in the Asia-Pacific including Australia, which might choose to allocate spectrum in the 800 MHz band to PSAs.<sup>20</sup> Motorola Solutions clarified that, were spectrum to be allocated in the lower part of the 800 MHz band, then it and other manufacturers would have to start customising chipsets for what would amount to a relatively small market resulting in a higher cost per unit.<sup>21</sup> Mr David Hill, Area North Manager, Government and Public Safety, Motorola Solutions explained that:

The chipsets have to be developed for a specific band set, or set of bands, depending on the particular region. Here, in Australia, chipsets are developed harmonised for all of the spectrum that is currently being used by the commercial operators. Similarly, there is a much larger potential market in the 700 megahertz band in the Asia-Pacific. I should clarify that point, too: we are not advocating using the North American band plan here, in Australia. We are advocating using the harmonised. When we are talking about the 700 megahertz spectrum we are talking about the harmonised Asia-Pacific spectrum, which has already been agreed by all the countries in the region.<sup>22</sup>

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16 Western Australian Government, *Submission 4*, p. 3.

17 Western Australian Government, *Submission 4*, Attachment 1, p. 1.

18 Mr Chris Cheah, ACMA, *Committee Hansard*, 24 June 2013, p. 16.

19 Mrs Maureen Cahill, ACMA, *Committee Hansard*, 24 June 2013, p. 17.

20 Mr Abul Rizvi, DBCDE, *Committee Hansard*, 24 June 2013, p. 26.

21 Mr David Hill, Motorola Solutions, *Committee Hansard*, 24 June 2013, p. 30.

22 Mr David Hill, Motorola Solutions, *Committee Hansard*, 24 June 2013, pp 29– 30.

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## Risk factors

5.15 Mr Hewitt of the NCCGR argued that there is a significance difference between the 700 and 800 MHz spectrum: there is a 'clear and free chunk of spectrum' now available in the 700 MHz band which is going to be used internationally for LTE and that in terms of commercial risks, the 700 MHz band is less of a risk than the 800 MHz band. Mr Hewitt noted that:

The choices of spectrum in 800 should be looked at quite carefully. If the chunk at the bottom of the 800 is used, the capacity for expansion is quite limited because you are sitting on top of the 700 megahertz allocation, which has already been allocated to commercial operators. It would, basically, snooker you into a corner.<sup>23</sup>

5.16 Mr Hewitt further explained that as there is only 10 MHz available in the 800 MHz to PSAs, it leaves 'nowhere to go after that'. Therefore, he concluded, PSAs should not be using that piece of spectrum if they wanted to expand their contiguous spectrum allocation at any stage.<sup>24</sup>

5.17 In response to this argument, Dr Kerans of the ACMA stated that if more data is required then PSAs can increase the density of their networks. In this regard, he noted that this is what commercial carriers do in cities and what the ACMA expects PSAs to do as their data needs increase into the future.<sup>25</sup>

5.18 However, PSAs emphasised to the committee that they do not, and cannot, operate in the same way as commercial carriers.<sup>26</sup> They provide a service to the community largely free of charge and cannot, therefore, reinvest profits into infrastructure to meet data needs as they arise. Given their mandate to save lives and protect the community, PSAs must respond to emergencies and disasters in a timely and effective manner in order to meet community needs and fulfil community expectations. Their operational decisions are based on saving lives rather than maximising return. For these reasons alone, PSAs cannot be expected to operate in the same way as commercial carriers.

## Securing the necessary spectrum in a timely manner

5.19 According to the ACMA, its offer of 5 MHz + 5 MHz of spectrum for public safety mobile broadband will be made available in 2015 in areas where PSAs advise that it is required. Dr Kerans from the ACMA explained that while the top 5 MHz (820 – 825 MHz) which is paired with 865–870 MHz is currently occupied, the block below (810 – 820 MHz) is clear as a result of the digital dividend and will be available in the same timeframe as the 700 MHz band. Dr Kerans further noted that the ACMA had given an undertaking to the PSAs that, 'provided they undertake to build a

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23 Mr Jim Hewitt, NCCGR, *Committee Hansard*, 24 June 2013, p. 35.

24 Mr Jim Hewitt, NCCGR, *Committee Hansard*, 24 June 2013, p. 35.

25 Dr Andrew Kerans, ACMA, *Committee Hansard*, 24 June 2013, p. 13.

26 Western Australian Government, *Submission 4*, Attachment 2, p. 18.

network' which he noted they have not done to date, 'we will commence the clearance of the band'.<sup>27</sup>

5.20 However, the PFA noted that while 10 MHz of spectrum in the 800 MHz band might be cleared by 2015, it would be 'exceedingly difficult to make 20 MHz of cleared spectrum available in that timeframe'.<sup>28</sup> Similarly, Motorola Solutions made the point that the 700 MHz network and the services to the PSAs would probably become available from 2014 whereas in the 800 MHz band, it might be available from 2017.<sup>29</sup> Motorola Solutions noted that:

Given the high level of incumbency in the 803–960 MHz band and the requirement to potentially relocate a significant number of users from parts of the band, it is envisaged that implementation will occur over an extended period.<sup>30</sup>

5.21 Motorola Solutions explained that the allocation of an additional 5 + 5 MHz (above the current offer of 5 + 5 MHz) in the 800 MHz band would take more than five years as it will require the clearing of currently occupied spectrum before any re-allocation was possible.<sup>31</sup> The PFA also noted that it could take five to ten years to clear out 20 MHz in the 800 MHz band 'depending on the current licences that exist there'.<sup>32</sup>

5.22 Motorola Solutions cited evidence from the ACMA which held the view that the timeframe for availability in relation to this option of 10 + 10 MHz would be 2017 at the earliest and amount to an allocation between 814 MHz and 824 MHz paired with 859–869 MHz.<sup>33</sup>

5.23 Evidence to the committee suggested, however, that the challenges in relation to clearing the 800 MHz band do not apply to the 700 MHz band which is 'ready to go'.<sup>34</sup> The recent auction of 700 MHz spectrum which is being made available through the digital dividend process left 30 MHz (15 + 15 MHz) of unallocated spectrum. Motorola Solutions noted that sufficient spectrum could be allocated from this band 'almost immediately' and would become available for use after the television re-stack process is completed at the end of 2014.<sup>35</sup> Similarly, the Western Australian Government noted that in contrast to the uncertainty surrounding the availability of

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27 Dr Andrew Kerans, ACMA, *Committee Hansard*, 24 June 2013, p. 19.

28 Police Federation of Australia, *Submission 2*, p. 9.

29 Mr Paul Thompson, Motorola Solutions, *Committee Hansard*, 24 June 2013, p. 29.

30 Motorola Solutions, *Submission 10*, p. [5].

31 Motorola Solutions, *Submission 10*, p. [8].

32 Mr Robert Waites, Police Federation of Australia, *Committee Hansard*, 17 June 2013, p. 5.

33 ACMA cited in Motorola Solutions, *Submission 10*, p. [6].

34 Mr Vince Kelly, PFA, *Committee Hansard*, 17 June 2013, p. 5.

35 Motorola Solutions, *Submission 10*, p. [6].



the 800 MHz band, provision in the 700 MHz band could be made when analogue television is switched off across Australia by the end of 2013.<sup>36</sup>

### Asia-Pacific Telecommunity

5.24 The International Telecommunications Union (ITU) has divided the world into three zones. During the World Radiocommunication Conference 2012, the 3GPP band 27 (807 – 824 / 852 – 869 MHz) was amongst the bands recommended for PSAs within the Asia-Pacific region (Region 3).<sup>37</sup> ITU Resolution 646 concerning public protection and disaster relief states that:

...to encourage administrations for the purposes of achieving regional harmonized frequency bands/ranges for advanced public protection and disaster relief solutions, to consider the following identified frequency bands/regions or parts thereof when undertaking their national planning:

- in Region 3: 406.1–430 MHz, 440–470 MHz, 806–824/851–869 MHz, 4 940 4 990 MHz and 5 850–5 925 MHz.<sup>38</sup>

5.25 A footnote regarding Region 3 notes that some countries in the region have also identified the bands 380–400 MHz and 746–806 MHz for PPDR applications.<sup>39</sup>

5.26 The ACMA's Senior Engineer, Mr Christopher Worley, informed the committee that there is no equivalent listing for PPDR for the 700 MHz band in Region 3.<sup>40</sup> Similarly, AMTA Chief Executive Officer, Mr Chris Althaus, argued that if PSAs were insistent on a standalone network, the 700 MHz band was the wrong spectrum band because the ITU had earmarked the 806–824 MHz and 851–869 MHz bands for Public Protection and Disaster Relief in the Asia-Pacific region.<sup>41</sup> Mrs Cahill of the ACMA also noted that the ACMA was working toward harmonisation in the 800 MHz band for public safety agencies across the region through the Asia-Pacific Telecommunity. She explained that:

We have been working very closely through the Asia-Pacific Telecommunity to have 800 as the spectrum identified for equipment manufacturers for public safety agency needs. It is, in our view, the optimal spectrum to enable economies of scale in terms of cost of equipment for the

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36 Western Australian Government, *Submission 4*, p. 3.

37 Ericsson, *Submission 3*, p. 7.

38 International Telecommunications Union, Resolution 646 (Rev.WRC-12), Public Protection and disaster relief, the World Radiocommunication Conference (Geneva) 2012, pp 4–5, <http://www.itu.int/oth/R0A0600001A/en> (accessed 10 July 2013).

39 International Telecommunications Union, Resolution 646 (Rev.WRC-12), Public Protection and disaster relief, the World Radiocommunication Conference (Geneva) 2012, footnote 6, p. 6.

40 Mr Christopher Worley, ACMA, *Committee Hansard*, 24 June 2013, p. 16.

41 Australian Mobile Telecommunications Association, Is a standalone emergency services network a cost-effective use of public funds?, <http://www.amta.org.au/articles/Is.a.standalone.emergency.services.network.a.cost-effective.use.of.public.funds> (accessed 4 June 2013).

public safety agencies, and also in term of interoperability within the Asia-Pacific region.<sup>42</sup>

5.27 Similarly, Orange Horizons noted that it would appear that the ITU was moving towards utilising 800 MHz spectrum in the Asia-Pacific region and that there was justification in maintaining compatibility with the ITU.<sup>43</sup> The ACMA held that 'international harmonisation' is highly important to Australia domestically and internationally, providing for equipment economies of scale, interoperability and cross-border roaming, as well as spectrum efficiency, while ensuring that the myriad of radio technologies used in all aspects of society can coexist without interfering with each other.<sup>44</sup>

5.28 Noting, however, that the harmonisation in question concerns the Asia-Pacific region rather than the international community as a whole, the committee received contrary evidence to that of the ACMA. Mr Hewitt of the NCCGR made the point that while the 800 MHz spectrum had been identified as the band for PPDR, it was used in Asia by police and emergency services for narrowband voice rather than broadband data.<sup>45</sup> Motorola Solutions also noted that ITU Resolution 646 was originally drafted to harmonise spectrum for narrowband operations or voice operations for two-way radio types of operations. The ACMA acknowledged that the resolution initially focused on narrowband radio and cited the resolution which stated that:

e) that current public protection and disaster relief applications are mostly narrow-band supporting voice and low data-rate applications, typically in channel bandwidths of 25 kHz or less;

f) that, although there will continue to be narrow-band requirements, many future applications will be wideband (indicative data rates in the order of 384-500 kbit/s) and/or broadband (indicative data rates in the order of 1 100 Mbit/s) with channel bandwidths dependent on the use of spectrally efficient technologies.<sup>46</sup>

5.29 The ACMA stated that it was engaged in the technical and operational considerations relating to broadband PPDR so that ITU-R Resolution 646 'can be amended to better reflect the trend in PPDR applications towards higher bandwidth applications'.<sup>47</sup>

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42 Mrs Maureen Cahill, ACMA, *Committee Hansard*, 24 June 2013, p. 15.

43 Orange Horizons Pty Ltd, *Submission 1*, p. [3].

44 Australian Communications Media Authority, *Supplementary Submission 7*, p. [2].

45 Mr Jim Hewitt, NCCGR, *Committee Hansard*, 24 June 2013, p. 37.

46 International Telecommunication Union, Resolution 646 (REV.WRC 12), Public protection and disaster relief, The World Radiocommunication Conference, Geneva, 2012, <http://www.itu.int/oth/R0A0600001A/en> (accessed 11 July 2013).

47 Australian Communications Media Authority, *Supplementary Submission 7*, p. [7].

5.30 However, Mr Hill of Motorola Solutions stated that:

In our region at the moment there is no agreement and that is part of the work that ACMA is doing with the APT and the ITU and to which we are also helping to contribute. But there is currently no agreement in the region as to what part of spectrum is to be used for public safety for broadband.<sup>48</sup>

5.31 Mr Hewitt of the NCCGR explained that while Australia might move to harmonise that spectrum as broadband data, the question remained as to whether the rest of the region would be prepared to 'push out all their own voice systems and replace them with the broadband data at some cost to themselves'.<sup>49</sup> Therefore, as Mr Hewitt explained, while harmonisation was a key consideration of the ACMA in its announcement that public safety agencies should operate on the 800 MHz band, there are no assurances that the region will undertake the necessary configuration to move from voice to data and purchase the compatible chipsets. The possibility remains, therefore, that Australia could, be left on its own with no commercial advantage.<sup>50</sup> The committee notes in this regard, ITU Resolution 646 which states that some countries in Region 3 have already identified the band 746–806 MHz for PPDR applications.

5.32 The ACMA acknowledged that while the ITU identified the 800 MHz band, there is no country in the Asia-Pacific region operating the 800 MHz band for broadband data at present.<sup>51</sup> Indeed, the ACMA's Dr Kerans explained that Australia is probably leading the region 'when it comes to allocating a band for public safety agencies and a number of the other regions were watching to see what we do'.<sup>52</sup> The ACMA emphasised that significant progress within Region 3 had been made on the development of a regionally harmonised plan while acknowledging that 'no endorsed plan is yet in place'.<sup>53</sup>

5.33 Submitters noted that decisions regarding the PPDR spectrum were expected to be taken at the World Radio Congress in 2015.<sup>54</sup> Therefore, the suggestion from the ACMA that ongoing alignment of Australian spectrum allocations with international regulations will benefit Australian PSAs from 'improved economies of scale in equipment manufacture and enhanced interoperability with overseas counterparts' is premature at best.<sup>55</sup> The NSW Police Force noted, for example, that it appears 'unlikely that there will be a significant demand for LTE equipment operating in the proposed harmonised PPDR 800 MHz band in the immediate future'. The NSW Police

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48 Mr David Hill, Motorola Solutions, *Committee Hansard*, 24 June 2013, p. 30.

49 Mr Jim Hewitt, NCCGR, *Committee Hansard*, 24 June 2013, p. 37.

50 Mr Jim Hewitt, NCCGR, *Committee Hansard*, 24 June 2013, p. 37.

51 Mrs Maureen Cahill and Mr Chris Cheah, ACMA, *Committee Hansard*, 24 June 2013, p. 15.

52 Dr Andrew Kerans, ACMA, *Committee Hansard*, 24 June 2013, p. 16.

53 Australian Communications and Media Authority, *Supplementary Submission 7*, p. 7.

54 APCO Australasia, *Submission 5*, p. 3.

55 Australian Communications and Media Authority, *Submission 7*, p. [2].

Force highlighted the views of the jurisdictions and law enforcement across Australia that:

There is still no certainty that international representations for an allocation of harmonised spectrum for PPDR in the 800 MHz band will come to fruition or that there will be sufficient demand generated for broadband equipment to generate competition, improve product availability and reduce development costs. The opportunities highlighted by the ACMA in previous submissions have not been realised.<sup>56</sup>

### **Committee view**

5.34 The committee supports the allocation of spectrum in the 700 MHz band for the purposes of a national PSMB network. The committee notes that the 700 MHz band is the preferred band of Australian PSAs themselves which have diligently examined and reported on their own requirements to the ACMA over the past three years. Notwithstanding this point, as the spectrum allocation process focused on the 800 MHz band for inception, the possibilities for PSAs in the 700 MHz band were not fully explored. However, the 2013 auction of spectrum in the 700 MHz band has provided a once-in-a-lifetime opportunity for the PSAs which cannot be overlooked.

5.35 While the committee appreciates the efforts of the ACMA in relation to international harmonisation, the evidence has demonstrated that there are considerable obstacles to harmonisation in the Asia-Pacific region. Such obstacles make harmonisation across the region, as well as the flow-on benefits including interoperability and potentially economies of scale, an extremely unlikely prospect. This prospect is made more improbable given that some countries in Region 3 have already identified the 746–806 MHz band for PPDR applications. Allocation of spectrum to PSAs in the 700 MHz band will, therefore, enable Australia to harmonise with at least some countries in the region.

5.36 The committee holds the view that it is imperative that Australian PSAs are resourced adequately to operate in an effectively, timely and efficient manner. Indeed, it is an expectation of the Australian public. As there remains 30 MHz of unallocated spectrum, the committee can foresee no reason as to why the ACMA cannot allocate 20 MHz of remaining spectrum in the 700 MHz band with immediate effect.

5.37 The committee recommends, therefore that the Minister for Broadband, Communications and the Digital Economy issue a Ministerial Direction to the ACMA to allocate 20 MHz of contiguous spectrum in the 700 MHz band for the purposes of a national PSMB network. Furthermore, the recommended 10 MHz of additional spectrum for PSA purposes should be provided in the 700 MHz band.

5.38 In the event that the committee's recommendation for 20 MHz of spectrum for PSAs in the 700 MHz band is not supported by the Australian Government, however, the committee recommends the reservation of 20 MHz in the 800 MHz band as the minimum requirement for a PSMB network.

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56 NSW Police Force, *Submission 17*, p. 2.

**Recommendation 1**

**5.39** The committee recommends that the Minister for Broadband, Communications and the Digital Economy issue a Ministerial Direction to the Australian Communications and Media Authority to allocate 20 MHz of contiguous spectrum in the 700 MHz band for the purposes of a public safety mobile broadband network.

**Recommendation 2**

**5.40** The committee recommends that the Minister for Broadband, Communications and the Digital Economy take appropriate measures to secure, for public service agencies, priority access to an additional 10 MHz of spectrum in the 700 MHz band for public safety purposes.

**Recommendation 3**

**5.41** If recommendation 1 is not supported by the Australian Government, the committee recommends that the Minister for Broadband, Communications and the Digital Economy issue a Ministerial Direction to the Australian Communications and Media Authority to allocate as a minimum requirement, 20 MHz in the 800 MHz band for the purposes of a public safety mobile broadband network.



# CHAPTER 6

## Overflow challenges

6.1 This chapter considers the issue of overflow and the challenges in achieving a functional overflow capability. In exploring overflow arrangements, the chapter details the technical, infrastructure, capability and public safety considerations which will need to be addressed if public safety agencies are to effectively utilise commercial networks during periods of extreme crisis and national emergency.

### Spill-over scenarios

6.2 All witnesses recognised that, in responding to a major national event or an event which may take place outside of the proposed PSMB network, overflow arrangements may be required. In such circumstances, a dedicated PSMB network would need to be supplemented by spill-over onto the commercial network when events occur outside of the proposed network.<sup>1</sup>

6.3 In March 2013, Mr Cheah of the ACMA highlighted that a key part of the national PSMB network will be the 'ability to roam between the fixed PSMB network and commercial networks'.<sup>2</sup> Dr Kerans, the ACMA, went on to explain that it was possible to parallel a commercial carrier network with the public safety network by use of network codes which can be portioned off and used almost exclusively depending on the agreement reached between the respective stakeholders.<sup>3</sup> Mr Sheehan, AGD, noted in this regard that overflow requirements were necessary as a mobile broadband dedicated capability will not provide for 'every single inch of landmass'.<sup>4</sup> Similarly, the AMTA explained that if the current plan to build dedicated PSMB capabilities in metropolitan areas is implemented, overflow arrangements with commercial carriers will be required.<sup>5</sup> Mr Rizvi from the DBCDE noted that:

The existence of these networks means that, subject to commercial negotiations, access to these networks could be made available relatively quickly, particularly in regional Australia, whilst public safety agencies progressively decide where to build their dedicated network. It also means that as commercial providers invest in new technologies, such as 4G mobile broadband, the benefits of each new wave of technology can be accessed by public safety agencies through commercial negotiations.<sup>6</sup>

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1 Department of Broadband, Communications and the Digital Economy, *Submission 14*, p. 3.

2 The Australian Communications and Media Authority and the Public Safety Sector—speech by ACMA Authority Member Chris Cheah to the Association of Public-Safety Communications Officials (APCO) Australasia 10th Annual Conference, Adelaide, 13 March 2013, [http://www.acma.gov.au/webwr/assets/main/lib550085/apco-mar\\_2013\\_chris\\_cheah\\_speech.pdf](http://www.acma.gov.au/webwr/assets/main/lib550085/apco-mar_2013_chris_cheah_speech.pdf) (accessed 10 July 2013).

3 Dr Andrew Kerans, ACMA, *Committee Hansard*, 24 June 2013, p. 15.

4 Mr Tony Sheehan, AGD, *Committee Hansard*, 24 June 2013, p. 3.

5 Australian Mobile Telecommunications Association, *Submission 6*, p. 4.

6 Mr Abul Rizvi, DBCDE, *Committee Hansard*, 24 June 2013, p. 21.

6.4 While the Overflow Capability Sub-Group is currently engaged in defining the circumstances when overflow may be required, the evidence suggests that it is most likely in regional areas and during major crisis when congestion occurs in metropolitan areas.<sup>7</sup> However, evidence to the committee suggested that the use of commercial carrier spectrum and networks during widespread natural disasters such as bushfires, floods and earthquakes is not always viable. According to Motorola Solutions, such disasters produce two often repeated outcomes which would restrict public safety access to commercial spectrum and networks. First, commercial networks are built to maximise profit and the resilience of sites is less than that which is expected from sites which are built to perform during emergency situations. Factors which contribute to the resilience of public safety network sites include equipment redundancy, link path redundancy and power system backup capacity, physical security and protection against cyber-attack. In addition, commercial networks are fundamentally designed to maximise the number of users, with relatively large number of small cell size sites compared to public safety networks. Second, the design capacity of commercial networks sites is limited to the expected 'normal day' peak loads. As the general public want to know about the status of family, friends and workplaces during periods of crisis, commercial spectrum and networks experience overload conditions during such situations. In contrast, public safety dedicated sites are designed for emergency situations and are expected therefore to cope with the peak loads anticipated during an emergency.<sup>8</sup> Motorola Solutions concluded that:

A situation where sites are unavailable for use due to equipment failure and where members of the general public are trying to check the status of family members and friends is a situation where commercial spectrum and networks are at or beyond their design capacity and are not available for public safety use.<sup>9</sup>

6.5 While there was consensus that overflow arrangements would have to be put in place, many witnesses raised serious concerns about how such arrangements would be established and managed, as well as the consequences for the general public. Central to these concerns are the significant operational differences between a consumer-designed network and a public safety network and how such difference may impact on the ability to PSAs to utilise commercial networks during emergencies. Tait Communications, for example, noted that only a private network would provide public safety with the 'quality of service, reliability, security and control' PSAs need to undertake their core business roles.<sup>10</sup> Similarly, the NSW Police Force raised concerns that the use of carrier allocated spectrum by law enforcement agencies would, in some

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7 The Overflow Capability Sub-Group is co-chaired by the DBCDE and NSW Telecommunications Authority. Its terms of reference include identifying options and models for engaging overflow from a dedicated PSMB capability to commercial networks (Department of Broadband, Communications and the Digital Economy, *Submission 14*, p. 3).

8 Motorola Solutions, *Submission 10*, p. [9].

9 Motorola Solutions, *Submission 10*, p. [9].

10 Tait Communications, *Submission 8*, p. 1.



instances, restrict consideration of tactical and investigative options.<sup>11</sup> The arrangements were also raised by the AFP which, as a Commonwealth agency, will not receive an allocation of spectrum under the PSMB network for its national operations. Instead, the AFP will have to rely on commercial providers for its own mobile broadband capabilities particularly during major events where the likelihood of extensive AFP involvement is heightened.<sup>12</sup>

## Coverage

6.6 Mr Rizvi of the DBCDE noted that commercial networks are already in place for around 25 per cent of Australia's land mass, covering in excess of 98 per cent of the Australian population.<sup>13</sup> The largest commercial carrier in the country, Telstra covers an estimated 27.3 per cent of the land mass of Australia. In terms of population numbers, Telstra has announced a target coverage of 66 per cent of the Australian population with LTE by mid-2013 and Optus announced plans to cover 70 per cent of the metro population by mid-2014.<sup>14</sup> In its submission, Telstra argued that it could commence a PSMB network by 2015 which would provide PSAs with additional capacity when required by way of priority access to infrastructure using Telstra's extensive commercial spectrum portfolio which is valued at several billion dollars and consists of 217 MHz of spectrum in metropolitan and regional areas and 167 MHz in remote areas.<sup>15</sup>

6.7 Mr Althaus from the AMTA noted that as the commercial networks currently cover the bulk of the country, this investment could be leveraged by a relationship with the PSAs. He explained that:

If you were step back and ask what it would cost to do our own network, specifically dedicated for public agencies, who knows what the cost might be? All I can say is that the initial allocation of money for this exercise in the United States was \$7 billion.<sup>16</sup>

6.8 Drawing on an Access Economics study commissioned by the AGD, the AMTA argued that a private network covering the entire landmass or Australia's population mass is not viable. Access Economics found that a private network using 700 MHz band could not be viably built to cover the entire landmass, or population mass, of Australia. It estimated that the cost of a private network using 700 MHz spectrum and reaching 80 per cent of the population would cost approximately \$242 million in capital costs and \$197 million in annual operating costs. It reported that the total cost of such a private network would 'exceed one using a commercial network

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11 NSW Police Force, *Submission 17*, p. 3.

12 Australian Federal Police, *Submission 9*, p. 1.

13 Mr Abul Rizvi, DBCDE, *Committee Hansard*, 24 June 2013, p. 21.

14 Ericsson, *Submission 3*, p. 11.

15 Telstra, *Submission 11*, p. 3.

16 Mr Chris Althaus, AMTA, *Committee Hansard*, 24 June 2013, p. 33.

reaching 99% of the population by hundreds of millions of dollars'.<sup>17</sup> If the private network were expanded to 99 per cent of the population, estimates suggested that the annual operating expenditure would increase more than tenfold.<sup>18</sup> Access Economics concluded as a consequence, the network would still be reliant upon both rapid deployment solutions such as COWs for coverage in both regional and remote areas as well as overflow onto a commercial network. Therefore, at some level, the PSAs will make use of commercial networks as a 'pure private network is not a solution'.<sup>19</sup>

6.9 However, the Access Economics study highlighted that Telstra is currently the only operator in a position to provide an adequate solution for the PSAs and that this situation might continue. It observed that solutions that rely solely on contract negotiations between PSAs and the commercial carriers may, therefore, be difficult to achieve on terms that are deemed suitable for the PSAs.<sup>20</sup> It noted that if, for whatever reason, the option based on commercial arrangements is not feasible, a private network using 700 MHz spectrum should be considered even with the substantial economic costs associated with such an option.<sup>21</sup>

6.10 Commercial operators hold significant amounts of spectrum, which, according to Ericsson is in the order of 100s of MHz which carry the large traffic volumes generated in commercial networks across both metropolitan and regional areas. As traffic continues to double every twelve months or less in many operator networks, operators are continually adapting and evolving their networks to deliver highly efficient mobile broadband capacity. Ericsson noted that for these reasons alone, it would be advantageous to consider the most effective way to leverage this vast mobile broadband carriage capability and its associated spectrum band diversity for PSMB applications.<sup>22</sup> Ericsson recognised the ability to leverage commercial operator LTE network coverage and capacity as an excellent opportunity to enhance situational awareness and achieve a common operating picture, particularly given that many Australian operators have existing spectrum holdings that are standardised for LTE,

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17 Access Economics, *Radiofrequency Spectrum Options for Public Safety Agencies*, September 2010, p. 24,

<http://www.ag.gov.au/RightsAndProtections/FOI/Documents/Access%20Economics%20Report%20dated%2010%20September%202010%20entitled%20Radiofrequency%20Spectrum%20Options%20for%20Public%20Safety%20Agencies.pdf> (accessed 10 July 2013).

18 Access Economics, *Radiofrequency Spectrum Options for Public Safety Agencies*, September 2010, p. 24.

19 Access Economics, *Radiofrequency Spectrum Options for Public Safety Agencies*, September 2010, p. 24.

20 Access Economics, *Radiofrequency Spectrum Options for Public Safety Agencies*, September 2010, p. 26.

21 Access Economics, *Radiofrequency Spectrum Options for Public Safety Agencies*, September 2010, p. 25.

22 Ericsson, *Submission 3*, p. 12.

such as 1800 MHz (2 x 10–20 MHz), or will deploy a number of LTE carriers in the near future, including 700 MHz (2 x 10–20 MHz) and 2600 MHz (2 x 20–40 MHz).<sup>23</sup>

6.11 Mr Althaus from the AMTA provided the perspective of the commercial carriers on the matter:

Yes, there is a need for a dedicated, nationally interoperable capacity and capability, but it is never going to be able to meet the coverage and the geographic spread of the commercial networks. So we are open to how it ultimately manifests itself. We are completely understanding and supportive of that nationally interoperable capability in mobile broadband.<sup>24</sup>

### **Resilience and reliability of commercial carrier infrastructure**

6.12 Orange Horizons noted that historically, during periods of national emergency, the commercial networks are 'amongst the first levels of communication to potentially fail'.<sup>25</sup> Similarly, the PFA observed that the scope for public safety agencies to utilise the network of commercial carriers when their own systems reach capacity was 'seriously undermined by the frequency of telco shutdowns in times of natural disasters'.<sup>26</sup>

6.13 The state jurisdictions raised a series of concerns about the technical and operational viability of the ACMA's proposed mitigation options, including commercial arrangements, to provide PSAs with sufficient data during a major urban incident. The WA, ACT, Victorian and NSW governments stated that while the jurisdictions acknowledge that some arrangements with commercial carriers may be a necessary part of a PSMB capability, they noted that commercial networks are known to present issues when congested or otherwise under duress, such as during emergency situations.<sup>27</sup> Indeed, the jurisdictions recognised the availability of commercial networks during emergencies as a significant risk for PSAs.<sup>28</sup> In light of these risks, the PFA expressed the view that reliance on a commercial carrier for overflow needs is not a solution to law enforcement communication needs across the continent.<sup>29</sup>

6.14 To highlight concerns with the resilience of commercial networks, the PFA drew on the work of the Telecommunications Industry Ombudsman which reported that 23 providers declared mass service disruptions (MSDs) due to natural disasters or

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23 Ericsson, *Submission 3*, p. 9.

24 Mr Chris Althaus, AMTA, *Committee Hansard*, 24 June 2013, p. 33.

25 Orange Horizons Pty Ltd, *Submission 1*, p. [4].

26 Police Federation of Australia, *Submission 2*, p. 7.

27 Western Australian Government, *Submission 4*, p. 2; ACT Government, *Submission 12*, p. 2; Victorian Government, *Submission 15*, p. 2; NSW Government, *Submission 16*, p. 2.

28 Western Australian Government, *Submission 4*, Attachment 2, p. 21; ACT Government *Submission 12*, Attachment 2; Victorian Government, *Submission 15*, Attachment 2, p. 21.

29 Police Federation of Australia, *Submission 2*, p. 9.

extreme weather between July 2012 and March 2013.<sup>30</sup> Heavy rains and flooding in NSW, the effects of the bushfires in Tasmania and deployment of technicians from Victoria to restore services in flood-affected areas were amongst the reasons for the 585 MSDs which delayed telephone or internet service repairs or connections for up to four months. The areas affected included the northern half of Queensland which was without telecommunication services for weeks during recent floods and cyclones.<sup>31</sup> However, large or densely populated areas including capital cities were also affected.<sup>32</sup> From 29 January to May, because of heavy rains and flooding, services could not be restored to areas in NSW within the requisite 20 days, and had to be granted an extension for up to four months. The areas affected included metropolitan Sydney, Greater Sydney, the Hunter, Central Tablelands and Illawarra districts. It also included Tasmania due to the bushfires in early January and more recently an exemption on the 20 day requirement for the restoration of services was declared for the whole state due to damaging winds.<sup>33</sup>

6.15 The 585 MSDs in the 2012–13 financial year amounted to almost 100 more incidents in comparison to 2011–12. As the PFA noted, the increase in disruptions is attributed to the increased number of severe weather events and the location and severity of those events. In contrast, however, the networks of police services are hardened in order to better withstand such breakdowns.<sup>34</sup> The jurisdictions provided a number of examples to highlight the fragility of commercial networks in contrast to the comparatively greater reliability, robustness and resilience of a PSA network. In June 2012, for example, power outages during an extreme storm in Perth caused disruption to a large number of carrier networks sites for up to three days in some areas. In contrast, the Western Australian Police low-speed data network was sustained thereby enabling police operations to continue.<sup>35</sup>

6.16 Orange Horizons argued that commercial carriers must be encouraged to improve the resilience of their networks given that they may be relied upon to augment the needs of a PSMB network. Without improvements, it is very possible that

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30 Telecommunications Industry Ombudsman, Natural disasters and extreme weather delay landline repairs and connections, *Media Release*, 4 June 2013, <http://www.tio.com.au/publications/media/natural-disasters-and-extreme-weather-delay-landline-repairs-and-connections> (accessed 25 June 2013).

31 Police Federation of Australia, *Submission 2*, p. 7.

32 Providers are required to repair or connect services between two and 20 working days depending on the remoteness and size of the location requiring repair but can claim an exemption when natural disasters or extreme weather cause problems. Telecommunications Industry Ombudsman, Natural disasters and extreme weather delay landline repairs and connections, *Media Release*, 4 June 2013, <http://www.tio.com.au/publications/media/natural-disasters-and-extreme-weather-delay-landline-repairs-and-connections> (accessed 25 June 2013).

33 Telecommunications Industry Ombudsman, Natural disasters and extreme weather delay landline repairs and connections, *Media Release*, 4 June 2013.

34 Police Federation of Australia, *Submission 2*, p. 7.

35 Western Australian Government, *Submission 4*, Attachment 2, p. 21.

commercial support systems may not be available.<sup>36</sup> Similarly, the AMTA suggested that the infrastructure of commercial networks could be 'hardened' to provide additional resilience and that in regional and remote Australia, it would likely be more cost effective to harden commercial mobile networks than to build a separate dedicated PSMB capability.<sup>37</sup> Telstra also supported the proposition of hardening the commercial networks through government investment to provide the additional resilience.<sup>38</sup>

6.17 However, Ericsson argued that infrastructure spend of PSAs could be diverted to hardening the networks of commercial operator sites and improving their recoverability and that it would be most cost effective to negotiate service agreements with commercial operators to utilise such resources.<sup>39</sup> Motorola Solutions highlighted that commercial networks use different technology to public safety networks and are designed to maximise a return whereas public safety networks are designed for a worst day. Mr Paul Thompson, General Manager, Government and Public Safety, Motorola Solutions explained that these are fundamental differences which also imply substantive costs involved in hardening the commercial networks if PSAs are to have available to them an equivalent service.<sup>40</sup> Mr Thompson noted that while partnerships with commercial networks will be vital in regional areas, the majority of incidents that emergency services are going to deal with are metro based. These will require rapid call set-up time, for example, 'if you are trying to communicate with a police sniper', and the ability to carry HD video if, PSAs require the ability to forensically identify whether a gun has left an assailant's hand. As such services are not expected to cover rural areas where PSAs are more likely to deal with natural disasters, Mr Thompson highlighted the importance of a combination of purpose-build public safety networks and public carrier networks.<sup>41</sup>

6.18 Tait Communications described the operational differences between a consumer designed network and a public safety network. It noted that commercial carriers are designed for data downloaded with equitable user access whereas a public safety network needs to be designed for data upload and have predetermined user access priorities.<sup>42</sup> Tait Communications identified a number of additional technical and operational issues that will require address if PSAs are to transfer onto the commercial networks. These include:

- the associated priority that each respective public safety user is assigned on the commercial network upon transfer;

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36 Orange Horizons Pty Ltd, *Submission 1*, p. [4].

37 Australian Mobile Telecommunications Association, *Submission 6*, p. 7.

38 Telstra, *Submission 11*, p. 3.

39 Ericsson, *Submission 3*, p. 12.

40 Mr Paul Thompson, Motorola Solutions, *Committee Hansard*, 24 June 2013, p. 30.

41 Mr Paul Thompson, Motorola Solutions, *Committee Hansard*, 24 June 2013, p. 31.

42 Tait Communications, *Submission 8*, p. 2.

- resolving the interconnectivity between the public safety broadband network and the commercial network including open-standard interfaces and network software version compatibility; and
- integrated priority management system.<sup>43</sup>

6.19 Orange Horizons raised the question of how carriers would be able to distinguish mission critical data in order to enable PSAs priority traffic on the networks and provide them with higher access levels given that once information (even voice) becomes data on the network, it is simply another item of data to be transmitted.<sup>44</sup> The jurisdictions also noted that the ability to roam or overflow onto a commercial network is a mitigation option but with caveats and the need for significant detailed planning. Furthermore, the 'rich ecosystem' of frequency bands and standards does not assure the ability of a PSA device to roam from a PSA network into a commercial network in times of need.<sup>45</sup> Indeed, the varying combinations of bands and standards present device manufacturers with 'unprecedented challenges to deliver seamlessly workable and affordable devices'.<sup>46</sup>

6.20 Mr Hewitt of the NCCGR argued that hardening commercial networks was not economically viable:

On the concept of hardening the commercial networks, I find that economically crazy, in fact. We would be less than one per cent of their carriage of data through their networks, yet you are going to spend hundreds of millions of dollars hardening complete fibre backbones that circle Australia to secure less than one per cent of the traffic that is being carried on those networks. That does not seem sensible; it does not seem economically rational. You would be way better off just putting in microwave, which is what we consistently use today.

We do not have the demand that the commercials do. We do not have millions of people—kids with flip phones downloading television programs. We do not have that sort of demand. Our networks are quite different. The idea of just putting in more sites and having more density to get more capacity is one of the weaknesses in the commercial systems. They put in lots and lots of sites in low-lying areas, so you get lot of good spectral re-use. Unfortunately, during something like the Newcastle floods they are underwater, so they stop working. That is another commercial difference between what we do and what they do.<sup>47</sup>

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43 Tait Communications, *Submission 8*, p. 5.

44 Orange Horizons Pty Ltd, *Submission 1*, p. [4].

45 Western Australian Government, *Submission 4*, Attachment 2, p. 19.

46 Western Australian Government, *Submission 4*, Attachment 2, p. 19.

47 Mr Jim Hewitt, NCCGR, *Committee Hansard*, 24 June 2013, p. 38.

## Community safety considerations

6.21 Motorola Solutions informed the committee that the use of commercial carrier spectrum and networks during a terrorist incident may not be viable for reasons including the possibility that explosive devices may be triggered through the use of commercial cellular networks.<sup>48</sup> Under such circumstances, public safety agencies should be able to call for the immediate closure of commercial carrier networks.<sup>49</sup> In the case of the Boston marathon bombings, Motorola Solutions explained that law enforcement agencies shut down the city's remaining operating commercial mobile communication systems up to 45 minutes after the explosions to prevent further potential detonations via those systems. The capacity to close, or make use of the commercial carriers' networks is therefore critical to public safety.<sup>50</sup>

6.22 Another key public safety consideration is that of protecting the sensitivity of PSA communications. Access Economics noted in this regard that where PSAs have arrangements with commercial carriers, information transmitted must be encrypted to ensure that information interception does not take place.<sup>51</sup> Access Economics continued:

Encryption means that interception of information at the commercial operator level is again not possible although a potential saboteur would be able to stop the transmission of information. This is a low probability but potentially highly adverse outcome, and there is a need for caution by the commercial operator to avoid any scope for this.<sup>52</sup>

### *Compromise of emergency warning system*

6.23 Another concern raised was that of the viability of the Emergency Alert system if PSAs take over commercial networks during periods of crisis. Emergency Alert is the national telephone warning system used by emergency services to send voice messages to landline and text messages to mobile phones within a defined area about a likely or actual emergency.<sup>53</sup> The service became operational on 1 December 2009.<sup>54</sup> Telstra noted that the Emergency Alert system had sent over seven million

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48 Mr Greg Thompson, Motorola Solutions, *Committee Hansard*, 24 June 2013, p. 30.

49 Motorola Solutions, *Submission 10*, p. [8].

50 Police Federation of Australia, *Submission 2*, p. 11.

51 Access Economics, *Radiofrequency Spectrum Options for Public Safety Agencies*, September 2010, p. 21.

52 Access Economics, *Radiofrequency Spectrum Options for Public Safety Agencies*, September 2010, p. 22.

53 Emergency Alert, <http://www.emergencyalert.gov.au/> (accessed 12 July 2013).

54 Emergency Alert, Systematic Review of Reports on Emergency Alert, Centre for Risk and Community Safety, RMIT University, 23 December 2011, <http://www.emergencyalert.gov.au/research.html> (accessed 12 July 2013).

messages in response to campaigns mounted by the Triple Zero agencies in Australia.<sup>55</sup>

6.24 Orange Horizons explained that the emergency warning systems for the general public could be compromised if the pre-emption to allow PSAs to have priority traffic on the network is too great which could render service levels compromised.<sup>56</sup> Drawing on the experience from an industrial fire that occurred in North Canberra in September 2011, Mr Hewitt from the NCCGR explained that:

...we were running the international alerting system out there. People were receiving SMSes to stay indoors, close their windows.<sup>57</sup>

6.25 Mr Hewitt noted, however, that those messages would not be received if PSAs were required to operate on the commercial networks. He explained that if PSAs had to rely on commercial networks, it would make the national emergency warning system less viable. Another important concern raised regarding the Emergency Alert system is that, as it would be expected, those who receive emergency messages will seek to inform themselves by going onto the network to obtain further information. In this way, the alerting system itself effectively drives up use on the network. Therefore, any limits on the ability for PSAs to warn the public and for the public to be informed in this manner would not be advantageous.<sup>58</sup>

### ***Public information and the growing importance of social media***

6.26 Evidence before the committee highlighted the importance of sustaining public access to the commercial networks during periods of crisis or emergency. Such provision enables members of the public to call for assistance, receive information and inform themselves about the crisis situation and make appropriate decisions. Information from the public can enable emergency responders to be kept up-to-date. According to Telstra, the most prominent example is the Queensland Police Service which used social media during the 2011 Queensland floods as a channel to deliver clear factual information on the nature of the disasters and provide advice to the wider community.<sup>59</sup>

6.27 Orange Horizons noted that, if PSAs are given priority on public networks and portions of the carriers normal customer base lose access, private video and other social medial information that 'has been critical to resolving incidents will be lost or not available'.<sup>60</sup> Furthermore, sources of intelligence used by first responders would effectively be cut off as Deputy Commissioner Phelan of the AFP explained:

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55 Telstra, *Submission 11*, p. 11.

56 Orange Horizons Pty Ltd, *Submission 1*, p. [4].

57 Mr Jim Hewitt, NCCGR, *Committee Hansard*, 24 June 2013, p. 36.

58 Mr Jim Hewitt, NCCGR, *Committee Hansard*, 24 June 2013, p. 36.

59 Telstra, *Submission 11*, p. 11.

60 Orange Horizons Pty Ltd, *Submission 1*, p. [4].



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...you would want to do anything you possibly could to maintain the flow of intelligence. The example that comes to mind is a major flood, where first responders cannot be everywhere and the amount of intelligence coming from the community could be vitally important... You do not want to restrict the capability of the public to send in that information based upon their normal 3G or 4G network...so law enforcement can use it.<sup>61</sup>

6.28 Similarly, Tait Communications raised concern that commercial networks remain accessible to the public during extreme circumstances to access emergency services and contact relatives and determine what assistance is required. Furthermore, as Tait Communications noted, business will need to communicate to support the community, economy and subsequent recovery.<sup>62</sup> Tait Communications also recognised the importance of social media:

...Public Safety needs the commercial networks to be operational to provide a channel for public information, a good example being via social media. The point is that the modern social and economic structure is based upon the availability of mobile commercial communications.<sup>63</sup>

6.29 Telstra observed that Australian society utilises mobile broadband communications as its primary communications media and method of interacting with the emergency services. For this reason, Telstra argued that it was imperative that any endeavour that focuses on mobile broadband for public safety and security embrace all dimensions of the law enforcement and emergency services business process from the citizen to the first responder and beyond.<sup>64</sup>

### **COWs**

6.30 Concerns were also raised regarding operational risks with the use of COWs which are part of the ACMA's mitigation strategy to increase data capacity in localised high-demand areas.<sup>65</sup> In their joint February 2013 submission, the jurisdictions noted that a greater allocation of spectrum could better support the operational responses of PSAs during the critical time period it would take to deploy COWs to provide that additional capacity.<sup>66</sup> They noted that a 10 MHz network would lead to greater reliance on COWs for reasons including that the data capacity available to PSAs from the fixed network at localised incident sites could be significantly less, and would likely require more frequent use of COWs in PSAs operations. Furthermore, the number of COWs needed to provide the adequate supplementary

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61 Deputy Commissioner Michael Phelan, AFP, *Committee Hansard*, 17 June 2013, p. 20.

62 Tait Communications, *Submission 8*, p. 4.

63 Tait Communications, *Submission 8*, p. 4.

64 Telstra, *Submission 11*, p. 11.

65 Western Australian Government, *Submission 4*, Attachment 2, p. 4.

66 Western Australian Government, *Submission 4*, Attachment 2, p. 16.

data capacity at incident sites would likely be greater as a 10 MHz COW would have less capacity than a COW that can utilise more spectrum.<sup>67</sup>

6.31 Mr Waites from the PFA explained the impracticality of utilising COWs during natural disasters and emergencies:

They are trailered systems you use to bulk up the network. Commercial carriers have those now and in planned operations police currently use them around New South Wales, Victoria and Queensland. But there is a limited number and they are trailerised. Given that in just about every emergency circumstance the first one or two hours are critical for the safety of police officers and certainty for the safety of the community, it will take in almost all cases longer than that to deploy COWs and set them up.<sup>68</sup>

6.32 The PFA concluded that such an option during natural disasters as a case in point together with the 4.9 GHz band which has 'serious limitations' do not constitute credible substitutes for 20 MHz in the 700 MHz band.<sup>69</sup>

### **Contractual arrangements with commercial operators**

6.33 The complexities of establishing workable contractual arrangements are evident in Europe. Mobile Virtual Network Operator agreements are currently under consideration in Europe to enable public safety access over public operator networks. Ericsson noted that this approach requires a number of additional features that are not yet deployed by commercial operators. These features are currently being developed and will have to be trialled.<sup>70</sup> Spectrum sharing solutions remain, however, in a research phase with current applications being considered to make better use of lightly-loaded spectrum by heavier and frequent users such as mobile operators.<sup>71</sup>

6.34 The jurisdictions highlighted evidence from the Gibson Quai-AAS study which warned that Australia could face similar legal issues to that of PSAs in the United States whereby an agreement could not be reached with carriers on priority access arrangements. According to the jurisdictions, this was 'primarily due' to carriers concerns about their exposure to legal liability claims from other customs who would have to be deprioritised.<sup>72</sup>

6.35 Access Economics identified some of the organisational difficulties in relying on commercial arrangements such as reaching contractual agreements, managing the market power of the commercial operator and enforcing contract terms. According to Access Economics, some of these difficulties could be avoided or minimised through

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67 Western Australian Government, *Submission 4*, Attachment 2, p. 23.

68 Mr Robert Waites, PFA, *Committee Hansard*, 17 June 2013, p. 7.

69 Police Federation of Australia, *Submission 2*, p. 8.

70 Ericsson, *Submission 3*, p. 8.

71 Ericsson, *Submission 3*, p. 8.

72 Western Australian Government, *Submission 4*, Attachment 2, p. 22.

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proper management possibly achieved through bilateral contracts or carrier or spectrum licence conditions.<sup>73</sup>

6.36 Telstra recognised the importance of contractual arrangements for access to commercial network sources being built into a partnership agreement. Telstra noted, however, that additional legal mechanisms were not required because provisions for declarations of emergency in Part 4.4 of the Radiocommunications Act are adequate.<sup>74</sup>

6.37 In contrast, the jurisdictions supported a regulatory framework to underpin any priority access, quality of service and network management arrangements with commercial carriers.<sup>75</sup> They argued that to reduce the risks associated with commercial carrier arrangements, the Commonwealth should provide for such a regulatory framework. Further, the jurisdictions argued that it was important that there are no constraints on the PSMB spectrum licenses issued to them, so as to best leverage commercial arrangements and synergies with commercial carriers.<sup>76</sup> Deputy Commissioner Phelan from the AFP also explained the importance of providing for a no-cost, or a cost-neutral, agreement for PSAs as it was inappropriate for police commanders to have to make decisions based on costs in a split second when lives are potentially at risk.<sup>77</sup>

6.38 Mr Rizvi from the DBCDE identified three options. These options include stipulating, as part of licence agreements with commercial carriers, arrangements with PSAs in order that it serves as a licence condition which specifies as part of the term and condition of the licence, the circumstances under which commercial networks will be seconded for emergency purposes. Second, that the Commonwealth, by way of legislation or regulation, has the power to override any licencing agreements to second network services under specific circumstances. The third option is that of a commercial negotiation with a commercial outcome based on good-faith discussions between PSAs and the commercial providers.<sup>78</sup>

6.39 However, Mr Rizvi also noted that while there is an opportunity for PSAs and commercial providers to discuss any such arrangements on a national basis, the PSMBSC is not aware of the current arrangements between jurisdictions and commercial providers which might otherwise provide a starting point.<sup>79</sup> Mr Rizvi highlighted in this regard that:

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73 Access Economics, *Radiofrequency Spectrum Options for Public Safety Agencies*, 10 September 2010, p. i, <http://www.ag.gov.au/RightsAndProtections/FOI/Documents/Access%20Economics%20Report%20dated%2010%20September%202010%20entitled%20Radiofrequency%20Spectrum%20Options%20for%20Public%20Safety%20Agencies.pdf> (accessed 10 July 2013).

74 Telstra, *Submission 11*, p. 8.

75 Western Australian Government, *Submission 4*, Attachment 2, p. 23.

76 Western Australian Government, *Submission 4*, p. 2.

77 Deputy Commissioner Michael Phelan, AFP, *Committee Hansard*, 17 June 2013, p. 20.

78 Mr Abul Rizvi, DBCDE, *Committee Hansard*, 24 June 2013, p. 22.

79 Mr Abul Rizvi, DBCDE, *Committee Hansard*, 24 June 2013, p. 23.

...at present, individual agencies may be using commercial networks in an ad hoc fashion. We are not across the details of how that works. What we are interested in is how to develop something like this for the future—how to develop that capability in a way that is satisfactory and interoperable across public safety agencies.<sup>80</sup>

6.40 Furthermore, Mr Rizvi acknowledged that the first question for discussion between PSAs and commercial carriers was the practical feasibility of such an arrangement, how it would operate and whether it would meet the needs of PSAs. The technical capabilities must be determined as well as their feasibility.<sup>81</sup> Mr Rizvi emphasised the need for PSAs to discuss overflow arrangements with commercial carriers on a national, holistic basis and to move away from bilateral discussions.<sup>82</sup> However, Mr Althaus from the AMTA noted that it was up to individual commercial carriers to explore the operational parameters of their investment, infrastructure, resources and how that relates to PSAs.<sup>83</sup>

6.41 Access Economics recognised key differences between the operations and motives of PSAs in relation to commercial carriers which will need to be taken into consideration. These include:

PSAs seek to maximise the benefit to society from their operation, almost always provide their services for free and generally provide the service to all those who require access to it. In contrast, commercial organisations generally seek to maximise profit and do so by finding an appropriate balance between prices charged, service quality and the number of customers served.<sup>84</sup>

6.42 In terms of establishing contractual arrangements, Access Economics identified some of the key steps required including specification of the service level requirements for each PSA. However, it also highlighted that the costs of failure to deliver services may result in serious harm and loss of life to members of the public. One option is to incorporate a clause in the licence conditions for the holders of the relevant spectrum that requires the carrier to provide priority services to designated PSAs in emergencies. While recognising that such a licence condition could 'introduce complications' into the auction of the spectrum, Access Economics argued in favour of the option where authorities were not assured that commercial arrangements could be agreed.<sup>85</sup> The fact that Telstra is the only carrier in a position to provide the high speed mobile services sought by PSAs may strengthen the argument for the

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80 Mr Abul Rizvi, DBCDE, *Committee Hansard*, 24 June 2013, p. 24.

81 Mr Abul Rizvi, DBCDE, *Committee Hansard*, 24 June 2013, p. 23.

82 Mr Abul Rizvi, DBCDE, *Committee Hansard*, 24 June 2013, p. 23.

83 Mr Chris Althaus, AMTA, *Committee Hansard*, 24 June 2013, p. 33.

84 Access Economics, *Radiofrequency Spectrum Options for Public Safety Agencies*, September 2010, p. 14.

85 Access Economics, *Radiofrequency Spectrum Options for Public Safety Agencies*, September 2010, p. 15.

incorporation of licence conditions in terms of holders of the relevant spectrum. According to Access Economics, the conditions may be couched in a way where they come into effect if the carrier attempts to set excessive charges of fails to meet basic reliability requirements.<sup>86</sup> Access Economics concluded that while it would be economically efficient for PSAs to make use of the commercial operator's network if suitable arrangements could be put in place and that it would be less costly to build reliability standards into commercial networks rather than establish a stand-alone private network, 'the consequences of a systems failure at a critical point may be extremely serious'.<sup>87</sup> Furthermore, there is a concern that carrier licence conditions imposed upon spectrum licences in the digital dividend could lead to a decline in the value of spectrum owing to an increased cost of set up.<sup>88</sup>

### **Committee view**

6.43 The provision of 20 MHz of spectrum for the purposes of a national PSMB network will assist in minimising the need for overflow arrangements. The committee further notes that part of the unsold allocation in the 700 MHz band is adjacent to Telstra which should allow for PSA overflow. At the same time, however, the committee appreciates that PSAs will have to rely on commercial carriers to meet overflow demands during critical periods and outside of the network in order to protect public safety, maintain law and order and preserve national security. This chapter has detailed some of the substantial operational, infrastructure, security and community safety challenges and risks that need to be overcome to provide for effective overflow arrangements including the viability of the Emergency Alert system.

6.44 The committee takes the view that any arrangement between public safety agencies and commercial carriers must be underpinned by a robust regulatory framework. Notwithstanding the provisions for emergencies contained in the Radiocommunications Act, a regulatory framework which sets out measures regarding priority access, quality of service and network management arrangements would provide surety regarding the conditions of any agreement between PSAs and commercial carriers. The committee therefore recommends that the AGD facilitate a public consultation process on the regulatory measures required to meet this objective.

### **Recommendation 4**

**6.45 The committee recommends that the Attorney-General's Department facilitate a public consultation process on a regulatory framework for overflow arrangements between public safety agencies and commercial carriers.**

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86 Access Economics, *Radiofrequency Spectrum Options for Public Safety Agencies*, September 2010, pp 15–16.

87 Access Economics, *Radiofrequency Spectrum Options for Public Safety Agencies*, September 2010, p. 16.

88 Access Economics, *Radiofrequency Spectrum Options for Public Safety Agencies*, September 2010, p. 19.



# CHAPTER 7

## Conclusions and committee view

7.1 Principle 1 of the ACMA *Principles for spectrum management* requires the allocation of spectrum to the highest value use or users'.<sup>1</sup> In addition, the object of the *Radiocommunications Act 1992* is to manage radiofrequency spectrum in order to, amongst other things 'maximise, by ensuring the effective allocation and use of the spectrum, the overall public benefit derived from using the radiofrequency spectrum'.

7.2 The committee recognises that there is no greater use of spectrum as a public resource than that of ensuring the safety of the Australian public. Public safety operations are essential to the public interest.<sup>2</sup> As noted by Mr Chris Cheah of the ACMA, public safety agencies have both particular operational needs and are a 'critical element of our national fabric'.<sup>3</sup>

7.3 In order to optimise the public benefit from the allocation of spectrum, the committee considers that PSAs require at least 20 MHz of spectrum in the 700 MHz band. Without sufficient spectrum to meet actual demands in the future, the decision to allocate 10 MHz (5 + 5 MHz) could have a serious impact on future emergency management capabilities and adversely affect the Australian population.

7.4 The first hours of a mission critical operational response, and particularly the first hour, are the most important in terms of saving lives and property. It is in this period that communications must operate seamlessly, in a timely manner and on an interoperable basis. The public expect that police and emergency service decision makers are provided with all necessary information to make critical decisions to protect lives and property in the event of a crisis or emergency. It would not be acceptable to the public to equip public safety agencies with less than the necessary communications capacity to deal with life-threatening situations.

7.5 The committee also appreciates that there is a growing expectation regarding the role of emergency services in strengthening the disaster resistance and resilience of communities as evidenced by various commissions of inquiry conducted into bushfires and floods. The ability of police and emergency services to meet such expectations (timely action to protect the public, order an evacuation or provide appropriate advice), is vital to sustaining public trust and cooperation. Law enforcement agencies and emergency services have a high public profile and often rely upon public cooperation and information to perform their functions. The inability of PSAs to act in a timely manner following an emergency or in response to a

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1 Australian Communications and Media Authority, *Principles for spectrum management*, March 2009, p.1, [http://www.acma.gov.au/webwr/assets/main/lib310828/principles\\_for\\_spectrum\\_management.pdf](http://www.acma.gov.au/webwr/assets/main/lib310828/principles_for_spectrum_management.pdf) (accessed 10 June 2013).

2 Mr Chris Cheah, ACMA, *Committee Hansard*, 24 June 2013, p. 7.

3 Mr Chris Cheah, ACMA, *Committee Hansard*, 24 June 2013, p. 7.

community need could not only have a detrimental impact on the community but also a significant and long-term effect on the reputation of the PSAs and particularly law enforcement agencies to serve and protect society. The committee recognises that the use of mobile broadband technology is a significant enabler to the effective use of information to deliver improved public safety outcomes as expected by the Australian public.

7.6 The objectives of a PSMB network as set out in Chapter 3 of this report include enhanced situational awareness are vital for PSAs to respond to emergencies and protect their own officers. In order to achieve these objectives, PSAs must be provided a minimum of 20 MHz in the 700 MHz spectrum and supported to establish a national PSMB network. The demise of analogue broadcast television has allowed the reallocation of the vacated 700 MHz part of the radio-frequency spectrum. This development has provided a unique opportunity to establish a national mobile broadband communications network. This network would allow various PSAs to better plan, coordinate and execute their missions using the most up-to-date communications technology, whether it be for their day-to-day operations or for responding to crisis events.

7.7 The committee appreciates that there will be situations in the future whereby public safety agencies will have to utilise commercial operators. Indeed, there was no single submission or witness to the inquiry which contradicted this view. However, the committee is mindful of the need to minimise reliance upon commercial carriers for reasons including their limited resilience and the considerable risks to public safety. Notwithstanding recognition of the commercial carriers themselves of a civil duty to support public safety agencies which is appreciated, the committee believes that any reliance upon commercial operators should be minimised. Provision of 20 MHz of spectrum is important in this regard.

7.8 The costs involved in the development and management of an effective and interoperable national PSMB will be considerable. Costs stretch to updating applications, utilisation of regular software releases and application of patches and enhancements which require modelling and testing before deployment into life networks. The committee appreciates that the operational costs involved in what will be a live and highly dynamic network represent a significant investment for operators.<sup>4</sup> However, the auctioning of spectrum in the 700 MHz band realised a significant financial dividend. The committee supports the view that this dividend should contribute to meeting the costs of securing a national PSMB network and recommends that the Australian Government finance the provision of spectrum for PSAs through the proceeds of the auction.

7.9 The committee understands that the US Government financed the spectrum of law enforcement and emergency services out of the proceeds of the auction of spectrum to commercial carriers and that in Canada, spectrum is provided by the

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4 Ericsson, *Submission 3*, p. 10.



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national government.<sup>5</sup> The committee takes a similar view as ultimately, public safety agencies provide a critical public service.

### **Recommendation 5**

**7.10 The committee recommends that the Australian Government direct an appropriate portion of the proceeds derived from the auction of spectrum to fund the allocation of 20 MHz of spectrum in the 700 MHz band for the purposes of a national public safety mobile broadband network.**

**The Hon Robert McClelland MP  
Chair**

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5 Police Federation of Australia, *Submission 2*, p. 11.



# **APPENDIX 1**

## **Submissions received by the committee**

1. Orange Horizons Pty Ltd
2. Police Federation of Australia
3. Ericsson  
Supplementary Submission
4. Western Australian Government (Attachment A Premiers Spectrum letter)  
(Attachment B PSMB Joint Submission) (Attachment C Information-  
Interoperability Blueprint) (Attachment D Victorian-Information-Network for  
Emergencies)
5. APCO Australasia
6. Australian Mobile Telecommunications Association (AMTA)
7. Australian Communications and Media Authority (ACMA)  
Supplementary Submission
8. Tait Electronics (Australia)
9. Australian Federal Police
10. Motorola Solutions Australia Pty Ltd
11. Telstra Corporation
12. ACT Government (includes the same list of attachments as the WA  
Government (Submission 4))
13. Attorney-General's Department
14. Department of Broadband, Communications and the Digital Economy
15. Victorian Government (includes the same list of attachments as the WA  
Government (Submission 4))
16. New South Wales Government (Attachment A State and Territories Joint  
PSMB Submission) (Attachment B Deloitte – International Public Safety  
Broadband)
17. New South Wales Police Force
18. Confidential

**Additional Information Received**

- 1 Police Federation of Australia - Public Hearing 17 June 2013, LTE - Coverage and Capacity

**Answers to Questions on Notice**

- 1 Answers to Questions on Notice from the Australian Communications and Media Authority at a public hearing on 24 June 2013

## **APPENDIX 2**

### **Witnesses who appeared before the committee**

**Monday, 17 August 2013 – Canberra ACT**

#### **Police Federation of Australia**

Mr Vince Kelly, President

Mr Mark Burgess, Chief Executive Officer

Mr Robert Waites, Consultant

#### **New South Wales Police Force**

Assistant Commissioner Peter Barrie APM, Commander, Operational Communications and Information

#### **Australian Federal Police**

Deputy Commissioner Michael Phelan APM, Close Operations Support

Assistant Commissioner Timothy Morris AM APM, National Manager High Tech Crime Operations

Mr Christopher Black, Manager High Tech Collections and Capabilities

**Monday, 24 June 2013 – Canberra ACT**

#### **Attorney-General's Department**

Mr Tony Sheehan, Deputy Secretary, National Security, Criminal Justice and Emergency Management Group

Mr Michael Pahlow, Assistant Secretary

Mr Jim Anderson, Director

#### **Australian Communications and Media Authority (ACMA)**

Dr Andrew Kerans, Executive Manager, Spectrum Planning

Mr Chris Cheah, Authority Member

Ms Maureen Cahill, General Manager, Communications Infrastructure Division

Mr Christopher Worley, Senior Engineer

#### **Department of Broadband, Communications and the Digital Economy**

Mr Abul Rizvi, Deputy Secretary

Mr Keith Besgrove, First Assistant Secretary, Digital Services

Mr Andrew Maurer, Assistant Secretary, Spectrum, Treaties and Internet Governance, Digital Services

**Motorola Solutions**

Mr Paul Thompson, General Manager Government and Public Safety

Mr David Hill, Area North Manager, Government and Public Safety

Mr Greg Bouwmeester, Southern Area Sales Manager

**National Coordinating Committee for Government Radiocommunications**

Mr Jim Hewitt, Representative

**Australian Mobile Telecommunications Association (AMTA)**

Mr Chris Althaus, Chief Executive Officer

Mr Steve Wilson, Engagement Lead, Public Safety, Utilities and M2M, Ericsson,  
AMTA Member