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.[1]

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'.[2] 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.[3] 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'.[4] 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.[5] 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.[6]

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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 (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.[7] 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.[8] 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.[9]

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.[10] 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.[11] 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.[12]

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.[13] 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.[14] 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.[15]

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.[16]

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

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'.[17] 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.[18] 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'.[19]

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.[20] 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.[21]

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.[22] 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,

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).[23]

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.[24]

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'.[25] 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'.[26]

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.[27] Indeed, the jurisdictions recognised the availability of commercial networks during emergencies as a significant risk for PSAs.[28] 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.[29]

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.[30] 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.[31] However, large or densely populated areas including capital cities were also affected.[32] 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.[33]

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.[34] 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.[35]

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.[36] 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.[37] Telstra also supported the proposition of hardening the commercial networks through government investment to provide the additional resilience.[38]

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.[39] 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.[40] 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.[41]

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.[42] 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.[43]

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.[44] 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 devise to roam from a PSA network into a commercial network in times of need.[45] Indeed, the varying combinations of bands and standards present device manufacturers with 'unprecedented challenges to deliver seamlessly workable and affordable devices'.[46]

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.[47]

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 devises may be triggered through the use of commercial cellular networks.[48] Under such circumstances, public safety agencies should be able to call for the immediate closure of commercial carrier networks.[49] 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.[50]

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.[51] Access Economics continued:

> Encryption means that inception 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.[52]

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.[53] The service became operational on 1 December 2009.[54] Telstra noted that the Emergency Alert system had sent over seven million

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.[55]

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.[56] 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.[57]

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.[58]

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.[59]

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'.[60] 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].

> …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.[61]

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 assistant is required. Furthermore, as Tait Communications noted, business will need to communicate to support the community, economy and subsequent recovery.[62] 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.[63]

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.[64]

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.[65] 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.[66] 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.[67]

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 carries 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.[68]

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.[69]

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.[70] 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.[71]

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.[72]

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.

proper management possibly achieved through bilateral contracts or carrier or spectrum licence conditions.[73]

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.[74]

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.[75] 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.[76] 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.[77]

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.[78]

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.[79] 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.[80]

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.[81] 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.[82] 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.[83]

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.[84]

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.[85] 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.[86] 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'.[87] 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.[88]

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.