Submission to the Environment and Communications References Committee

'The capacity of communication networks and Emergency Warning Systems to deal with emergencies and natural disasters.'

PURPOSE

This submission seeks to outline the changing nature of how communications and information technology systems can be utilised to help make mission-critical communications simpler, more effective and more efficient for emergency services responders. In so doing, this will highlight current and emerging hurdles to existing systems' capacity to best cope with emergencies and natural disasters. In particular how the current lack of suitable broadband spectrum for public safety is impacting their ability to deploy advanced technologies and applications that could revolutionise the way our public safety organisations fight crime, respond more rapidly to disasters, and save lives. For these reasons, it is critical for the decision to be made in favour of allocating 700 MHz spectrum from the digital dividend for our public safety, emergency and law enforcement agencies.

INTRODUCTION

Currently our public safety organisations rely upon purpose built, resilient dedicated narrow band two way radio networks for their mission critical communications. Spectrum is the life blood of these networks. In recognition of this fact, a relatively small segment of spectrum was recently dedicated nationally for exclusive use by Government agencies for voice and narrow band data applications.

The steady drive toward next-generation solutions is also bringing with it the need for dedicated spectrum for a public safety mobile broadband network. The public safety community worldwide is united in its belief that 700 MHz spectrum should be used for this broadband network. This resource represents the preferred technology standard for these 4G broadband wireless networks to support these mission critical applications.

Just as there is growing demand among the community and business for reliable, high-speed broadband with mobile connectivity, real-time, accurate information is more crucial than ever for public safety and leveraging increasingly sophisticated ways to collect that data is essential to the success of fighting and preventing crimes, saving lives and properties. Public safety agencies are embracing next-generation technology, which enables emergency services responders to realise tailored mobile broadband connection speeds and to access rich-media applications with the appropriate level of prioritisation from advanced collaborative data devices.

These solutions maximise operational effectiveness by converging voice, image, data and video communications from a multimedia, integrated operations centre and extend the reach of existing mission-critical communications networks. With stronger networks and greater capabilities, public safety agencies can supplement voice with rich data and video content to empower emergency services responders with the best information when and where it matters most to best serve and protect the community.

Solutions that provide real-time information about situations through access to multiple data bases and platforms from within one robust application enhance interoperability, information sharing, collaboration and much more. This helps connect critical resources across agencies and jurisdictions and between mission-critical two-way broadband networks. Therefore, whilst agencies will continue to primarily rely on their mission critical two way radio networks for voice communications, access to video and data records with associated applications will significantly enhance their efficiency and effectiveness.

To achieve this, public safety agencies need support from the Federal Government to:

a) Continue development of statewide, and nationwide dedicated mission critical voice networks which have the capacity and availability to cope with both man-made and natural disasters. These networks need to be built in the Government narrow band 400 MHz spectrum specified by ACMA to ensure interoperability with state agencies providing support in response to disasters.
b) Ensure an appropriate portion of 700 MHz digital dividend spectrum is dedicated for public safety to enable overlay of dedicated mission critical broadband capability on these existing voice networks. Public Safety broadband can be complemented with opportunistic use of carrier broadband networks to complement coverage outside major population areas.

Motorola Solutions ('Motorola') has a proud history of world-leading innovation and is an existing partner to a number of state government agencies for their mission-critical communications. Motorola has a global network of development teams and is also well represented in the Australian business community. A public safety broadband network provides a strong opportunity for government to take the best approach to leveraging technological advances to ensure the greatest protection for the community.

Motorola provides this brief response to selected and relevant references of this Senate Inquiry in order to provide an industry perspective on emerging challenges and opportunities in the emergency communications space.

Should the Committee wish, senior personnel from Motorola would be available to either brief Committee Senators or present to the inquiry on any of the following or related points.

BACKGROUND

The Federal Government is planning to auction a 126 MHz block of the 700 MHz radio spectrum, specifically from 694-820 MHz, that will become available to market through the migration of Television services from analogue to digital transmission.

This relatively low frequency spectrum provides larger coverage than other higher frequency bands typically used by mobile telephony. This means that fewer sites (i.e. mobile towers) are required to cover a given area.

Given the 'prime real-estate' that this spectrum offers, there is fierce competition for this band among telecommunications companies who recognise the advantage it poses for mobile broadband and telephony channels. Whilst these organisations have offered to essentially on-sell sections of this spectrum for purposes such as public safety, the practicalities of this are difficult. Crudely, even the most altruistic provider is faced with market pressures and profit goals, whereas the principles underpinning public safety communities are more utilitarian.

Indeed, telecommunications companies, rightly, want to make money by leveraging their investment to the maximum. In practice, this involves shaping their network profile and service offering to ensure the greatest number of customers can access it at a commercial rate of return on that investment. Public safety users, however, require a ready form of access that would jeopardise this return.

Australia's State and Territory Governments will not be able to compete against telecommunications companies at the proposed spectrum auctions for this valuable resource. Emergency services responders and the public they serve will miss out on this once-in-a-lifetime opportunity for a nationally interoperable mobile broadband network with the sole purpose of protecting Australia's people.

The Federal Government can help facilitate the provision of the best service, with the lowest impost to telecommunications companies and make use of the best emerging technologies to service their populace by allocating some of the 700 MHz digital dividend spectrum to emergency services use. This would allow public safety agencies to develop broadband networks optimised to meet their mission critical operations, with the choice of roaming onto the carrier networks as required.

CURRENT TELECOMMUNICATIONS CONTEXT

In the world today, there are broadly 4 grades of products, in descending order of toughness and increasing size of the market served:

- Military-grade: These products are almost indestructible, and their price is astronomical because of the environment that they are expected to operate in, e.g., in the battlefield, in rain and snow, blowing dust and sand, extreme temperatures, and constant off-road environments. These products cannot fail short of a direct hit from a mortar round. These products are usually custom-designed for the military. The price is high partly because the market for these products are extremely limited, and the products' inability to sell into the other non-military markets.

- Mission-critical grade: May also be known as 'public safety grade' and 'industrial grade'. Products made to this level are built-tough, and specifically designed for tough environments that most average people don't usually work in. These can be hazardous environments or environments that become unsafe unexpectedly. Products must be designed to much higher level of standards for durability, safety, performance, reliability, and functionality. Because of this product's level of toughness and lower price than military grade products, some military organisations will buy these products for use in less demanding mission environments. The military classifies these products as 'commercial off-the-shelf' or COTS products. Products of this category are used in businesses that impact the society or large populations in a very large manner. Failures of mission-critical products can mean a difference between life and death.

- Commercial-grade: Products made to this grade are generally for the office environment. Commercial grade products are not expected to be as tough as the mission-critical products, but they are expected to work reasonable well with the travelling public for a few years, and can break if care is not used. These products also tend to be cheaper than mission-critical grade products because of the lower performance requirement. They have broad appeal to many people. Most commercial grade products cannot work in known hazardous environments. Common laptop PCs and cell phones are commercial-grade. Failures of commercial products result in inconvenience to the owner. Because of this product's level of functionality and lower price than mission-

critical grade products, many businesses organisations will buy these products for use in less demanding and non-critical environments.

- Consumer-grade: Products in this grade are generally for the home or for leisure. Consumer products are not tough at all, but they still must pass safety certification. Consumer products have the broadest market size to serve, and will have the lowest prices in the marketplace. They are generally for personal use and not for business use.

It is the category of mission-critical robustness which should be focussed on to ensure that there is capacity within emergency services telecommunications networks and emergency warning systems to deal with emergencies and natural disasters. Steps should be taken by the Federal Government to ensure that its' policy settings for spectrum allocation are focussed on the objective of best providing for the security and protection of Australians. This will provide the means that will then enable the States and Territories to meaningfully plan for broadband radiocommunications for their own public safety responders.

A public safety oriented mobile broadband network would provide key differences from a commercial service. Firstly, it provides greater resilience to congestion and failure in major events where instant communication is most vital. Secondly, such a network also provides a greater degree of customisation ability to individual agencies to suit the capacity they require.

Finally, despite the claims of telecommunications providers to the contrary, a bespoke network obviates any Quality of Service and Prioritisation discussion by dynamically managing groups or individuals most critical to serving an incident. The present regime of carrier-defined Quality of Service falls short in ensuring public safety. An effective public safety mobile broadband system ensures the most urgent data is sent, even if it has to delay or pre-empt less critical data. In practice, a user's profile, determined by agency, individual role, incident level and participation allows for prioritisation through service tiers and thus dynamically adjusts prioritisation based on the individual, their application and the incident itself.

THE IMPACT OF EMERGENCIES AND NATURAL DISASTERS ON, AND IMPLICATIONS FOR, FUTURE COMMUNICATION TECHNOLOGIES SUCH AS THE NATIONAL BROADBAND NETWORK

Much has been made politically of the perceived differences between the broadband policies of the respective major parties. The Government's NBN relies principally upon fixed-line fibre, however has a very strong interplay with wireless offerings. The Coalition's proposal has far less a focus upon fibre, and more upon wireless, however the mix within both policies indicates strongly the realisation among legislators that these technologies are complementary and that the goal is connectivity and productivity rather than modality of connection. It is simply a statement of fact that to have high-speed wireless connectivity, one must have a sufficiently large backhaul infrastructure to empower it. Wireless is, by definition, a shared service and thus needs further assistance through the dedication of certain units of spectrum to fully realise its potential in addition to the raw investment in its enabling backhaul.

Responding to natural disasters necessitates a high level of situational awareness to inform the dynamic strategies required for management, containment and recovery. New technologies such as the NBN will provide this service, however are also susceptible to damage, destruction or other interference throughout the emergency and once recovery is underway. The impact of the Black Saturday Bushfires was worsened through the effective reduction or in some instances total destruction of civilian communications channels and the lack of interoperability between emergency service communications technologies. The latter point was also true for the Canberra bushfires. Such vulnerabilities are not reflective of the intrinsic technologies themselves, rather the scale of the situation saw weaknesses exposed and unacceptable and tragic human outcomes realised.

Through the utilisation of a portion of the 700 MHz spectrum, capacity could be created to realise a dedicated public safety broadband network. Allocation of an element of this spectrum – somewhere in the order of 2% of this resource – would ensure a reliable, robust communications network that will meet the current and future needs of modern emergency services responders.

Such a utilisation of next-generation technology would maximise operational effectiveness by converging voice, image, data and video communications. This would have the benefit of connecting critical resources across agencies and jurisdictions. Further, it would provide the best ecosystem for innovation and further development of exciting technologies to be best utilised by Government in protecting its citizens.

NEW AND EMERGING TECHNOLOGIES INCLUDING DIGITAL SPECTRUM THAT COULD IMPROVE PREPARATION FOR RESPONSES TO AND RECOVERY FROM AN EMERGENCY OR NATURAL DISASTER

The public safety community, across jurisdictions, has faced growing challenges when dealing with large scale disasters. Some facets are beyond any form of control, however in the 21st century, from a technological perspective, first responders cannot be left with old-world communications equipment the equivalent of fighting a raging inferno with a volunteer bucket-brigade or sandbagging a flood with garden tools: Communication technologies have the power to provide a quantum step forward in how we respond to emergency situations however these technologies need to be empowered by sound policy development.

Spectrum, and the correct allocation of it, is critical to this step forward.

Communications technologies are already being brought to bear to assist in bushfire spotting and telemetry, emergency patient care and remote triage through the Government's Digital Regions Initiative program. Because of the rollout of next generation technologies however, there is an unprecedented opportunity to utilise standardised technology for a mission-critical mobile broadband solution to use these technologies to actively combat disasters and save lives.

The promise of public safety broadband enables the ability to share large amounts of multimedia information. An effective, dedicated, public safety broadband service which can only be achieved on the 700 MHz spectrum, could drive a shift so profound that across agencies, jurisdictions, applications and incidents, data and video sources will become as trusted as voice has become to emergency management.

This spectrum allocation to empower a mobile public safety broadband network is crucial as commercial grade mobile telephony networks are simply unsuitable for the previously stated reasons. To illustrate this point further though, the inquiry should ask itself: "if signals drop out on New Year's Eve, or Grand Finals cause delayed access and dropped calls due to congestion, how can they possibly cope with emergency situations?".

Obviously, spectrum is an enormously significant resource and attracts huge revenue. Public safety organisations are requesting an allocation of 20 MHz (10+10 MHz) from the 700 MHz digital dividend. Proportionally, this represents only $220 million from the $1 billion expected to be raised from the full auction of the 126 MHz. However, were Government to reserve some of this spectrum for the public safety community, simple demand economics would increase the value of the remaining spectrum. Thus, the actual cost to the Government of allocating spectrum for this purpose would actually be lessened.

Clearly, such a move would draw the ire of telecommunications companies, however when whatever claim they make is compared to the real costs of the Black Saturday fires (in excess of $4 billion according to the Victorian Bush Fire Royal Commission) and the Brisbane element of the Queensland floods (in excess of $30 billion according to IBIS) the difference is stark. Indeed, the estimate for the entire contribution of the mobile telecommunications industry to the Australian economy is $6.7 billion whereas the total cost of crime and disasters tops $33 billion per annum.

Unlike the mobile phone industry, the public safety community have no spectrum suitable for wireless broadband. Ultimately, the public safety community is only requesting 20 MHz, which represents less than 2% of the total 3G/4G spectrum available to the telecommunications carriers to operate their mobile phone networks. The improved efficiency afforded to the entire community should and must outweigh the cost to the mobile phone industry.

ABOUT MOTOROLA SOLUTIONS

Motorola Solutions is a leading provider of business and mission-critical communication solutions for enterprise and government customers. With more than 75 years of experience in wireless communications, Motorola Solutions has earned a solid reputation as trusted partner to many public safety agencies and local, state and federal governments.

We are a worldwide leader in nearly all the markets we serve, with a highly diversified customer base, operations in over 65 countries and an unmatched portfolio of innovative technology offerings.

With a heritage of over 40 years in Australia, Motorola Solutions has been at the forefront of local innovation, and is driving next-generation communications technology to help connect and mobilise enterprise and government customers in the moments that matter most to them.

Motorola Solutions has built more than 500 standards-based, public safety networks in 90 countries around the globe, and our solutions form the basis of emergency communication networks, applications, devices and services currently relied on by public safety agencies across Australia.

Motorola Solutions meets a wide range of customer needs through our public safety solutions, mobile computing technology, advanced data capture, integrated command and control communications, WLAN solutions and advanced services.

We have consistently delivered new ways for governments and businesses to connect from the first ever two-way radio and the first ever hand held laser scanner to cutting-edge mobile computers and the latest in wireless networking solutions.

Our secure mobility solutions are tailored for industries such as retail, energy and utilities, transportation and logistics, manufacturing and supply chain, healthcare and other commercial markets. Our mission-critical solutions such as the TETRA systems and APCO P25 systems are trusted by governments, public safety agencies and strategic infrastructure operators across region.

Along with this portfolio, Motorola Solutions offers support tools and services to many Fortune 500 companies and governments and offers a distinctive reach through an extensive network of channel partners, as well a large range of vertical markets.

On January 4, 2011, Motorola Solutions, Inc., formerly Motorola, Inc., separated from Motorola Mobility Holdings, Inc. to become a stand-alone company. With its financial strength, disciplined financial policies and commitment to innovation, Motorola Solutions is well positioned for future growth and profitability.