



Australian Mobile  
Telecommunications  
Association

**AMTA Submission:**

## **Five-year spectrum outlook**

**2013-2017**

**The ACMA's spectrum demand analysis and  
strategic direction for the next five years**

**December 2013**

## Introduction

The Australian Mobile Telecommunications Association (AMTA) is the peak industry body representing Australia's mobile telecommunications industry. Its mission is to promote an environmentally, socially and economically responsible, successful and sustainable mobile telecommunications industry in Australia, with members including the mobile Carriage Service Providers (CSPs), handset manufacturers, network equipment suppliers, retail outlets and other suppliers to the industry. For more details about AMTA, see [amta.org.au](http://amta.org.au).

AMTA supports the Australian Communication and Media Authority (ACMA) in its efforts to plan for Australia's future spectrum requirements and welcomes this opportunity to comment on the ACMA's *Five-year Spectrum Outlook 2013-2017* (Outlook) as part of the preparation for the publication of the ACMA's *Five year Spectrum Outlook 2014-2018*.

While the Outlook provides a useful mechanism for industry and the ACMA to work together to plan in the short-term, AMTA also believes that is important for industry and the ACMA to work together to form a long-term view about spectrum demand. AMTA is committed to participating in the ACMA's consultative processes with regard to long-term spectrum demand forecasting and planning.

## Australia is a *Mobile Nation*

In February 2013, AMTA launched the *Mobile Nation* report by Deloitte Access Economics. The Report researched the economic and social impact of mobile on Australia's economy, and found that the current wave of mobile technologies will result in a productivity benefit to the Australian economy of \$11.8 billion over the period to 2025.

The Report found that the capacity of the mobile sector to enable more productivity growth means that technological developments in the sector and their diffusion throughout the economy has the potential to reverse Australia's declining productivity performance.

The Report also found the most critical issue for the mobile sector is policy and regulation with regard to spectrum allocation and licensing.

Demand for spectrum continues to grow exponentially under the unrelenting pressure of consumer demand for mobile data.

Ericsson's latest Mobility Report found that smartphone traffic will increase by 10 times between 2013 and 2019. Mobile broadband subscriptions are also expected to exceed 2 billion in 2013 and LTE is forecast to cover more than 65% of the world's population in 2019.<sup>1</sup>

Australia's mobile network operators are making significant investments in network infrastructure including spectrum as they roll out 4G networks.

The Mobile Nation Report concluded that in order,

*"To maximise the benefits of mobility in the digital economy, spectrum policy settings must be reviewed and allow for the staged expansion of spectrum resources to mobile broadband."*

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<sup>1</sup> [Ericsson's Mobility Report](#), November 2013

## Reform of the Radcomms Act

AMTA considers the ACMA's Outlook to be a useful outline of the ACMA's work program that also informs both Government and industry about the supply and demand for spectrum resources in the short to medium term.

However, AMTA believes that the ACMA's work program needs to be supported by a strong policy framework in relation to spectrum management, allocation and licensing.

Spectrum is critical infrastructure for mobile services and a key driver of productivity. However, the complexity associated with spectrum allocation and spectrum licence renewal has resulted in inefficiencies and a costly burden on industry.

AMTA therefore believes that a review of the Radcomms Act and supporting regulatory framework in light of the recently undertaken spectrum licence renewal processes is timely and could potentially result in significant micro-economic reforms of lasting benefit to Australia's economy.

In undertaking such a review, AMTA recommends that the ACMA considers:

- Streamlining and simplifying decision-making processes for spectrum allocation and licence re-issue to provide certainty for industry;
- A review of price-setting mechanisms for spectrum access charges – including how prices are set at auction, licence re-issue, apparatus licence fees and how spectrum is taxed;
- Establishing a common approach to the planning, allocation and management of broadcasting and non-broadcasting spectrum that provides for market-based allocation and the extension of secondary trading i.e. a platform-neutral approach;
- Establishing flexible consultation processes and standardised timeframes for Regulator responses. (e.g. regional 1800 MHz and 900 MHz allocation processes have been open-ended and do not provide the requisite certainty for industry to make investment decisions); and
- Developing a spectrum policy roadmap to outline a clear policy approach to making spectrum available for IMT in a timely manner, under a clear and simplified regulatory framework, at reasonable price that will not deter investment.

## 1800 MHz Planning and Pricing

In December 2012, the Australian Communications and Media Authority (ACMA) indicated its consideration of proposed changes to allow mobile services to operate under public telecommunications services (PTS) apparatus licences in the 1800 MHz band in regional and remote Australia. The proposal identified a number of complex issues including the need to balance competing interests in the band, most notably, the large number of incumbent fixed link services and future mobile services.

AMTA considers it essential that all opportunities to release new spectrum for mobile use are closely examined. This claim is made on the basis that the mobile industry contributes \$14 billion to the Australian economy and drives productivity growth across many sectors. Spectrum is an essential enabler to the mobile industry and its use is critical to maximising the benefits of mobility in the economy.

The regional and remote 1800 MHz spectrum presents an opportunity for the mobile industry to achieve timely access to further new spectrum.

AMTA also strongly supports the ACMA's stated policy position to apply opportunity cost pricing as a principled approach to setting spectrum access charges for administrative allocations. AMTA agrees with the ACMA that opportunity cost pricing aligns with the Spectrum Management Principles and promotes efficiency in spectrum markets.

In order to further explore current thinking on these matters, AMTA sought independent expert advice from Covec Ltd and supplied the resulting report to the ACMA in May 2013. AMTA believes that the conclusions in the Covec study merit consideration by the ACMA.

In particular, Covec concludes that the tax should be based on opportunity cost and not the Minister's spectrum licence reissue price, and the use of a pre-tax WACC is the best approach in the tilted annuity calculation. Covec also concludes it is mathematically incorrect for the ACMA to compare the pre and post-tax WACC methods by simply scaling up the latter by the corporate tax rate.

Finally, AMTA's members are in agreement that in regional and remote areas where there are no incumbent fixed links, 1800 MHz spectrum should be released as soon as possible for mobile services.

Where fixed links exist, AMTA would appreciate clarification from the ACMA regarding its planning process for identifying:

- regional and remote areas suitable for short-term allocations of 1800 MHz spectrum for mobile use (areas with either no fixed links or areas where deployment can be successfully co-ordinated with existing fixed links – noting that AMTA's members are agreed that in these areas spectrum should be released as soon as possible);
- a set of criteria that explains how the ACMA will make decisions regarding the allocation of spectrum via apparatus licences; and
- its approach to pricing (noting that the ACMA has had considerable time in which to review the Covec study provided by AMTA in May 2013 as well as other factors).

## Future Bands for IMT

Frequency Band (MHz)	Summary of current Australian Usage	AMTA view
470–520	470–520 MHz is mainly used for narrowband land mobile services. Other services include narrowband and wideband fixed services, citizen band radio and some low interference potential device (LIPD) applications.	AMTA supports IMT in this band but notes that existing land mobile service occupancy of this band would need to be addressed before the band could be used for this purpose in Australia.
520–694	520–694 MHz is used for digital television terrestrial broadcasting services. Other designated uses include some low interference potential device (LIPD) applications, such as wireless audio devices and biomedical telemetry devices.	Similarly, while AMTA supports IMT in this band, existing and planned broadcasting services may delay access in Australia, until the NBN is largely completed, and there is national interest in migrating traditional over the air broadcasting to alternative and more efficient delivery mechanisms. AMTA suggests that minimum designations should be 2 x 40 MHz with at least a 10 MHz duplex gap (FDD) or 80 MHz (TDD) to ensure that any new deployments are economically feasible.

Frequency Band (MHz)	Summary of current Australian Usage	AMTA view
694–790	<p>694–790 MHz forms part of the digital dividend within the 700 MHz band (694–820 MHz). While this band is currently used for digital television terrestrial broadcasting services, restack of these services below 694 MHz is expected to conclude by the end of 2015. Similarly, while this band is currently used for wireless audio transmitters, these applications are expected to cease in this band by 31 December 2014.</p> <p>703–748 MHz/758–803 MHz is subject to Australia-wide spectrum licensing with IMT services expected to commence in 2015.</p> <p>698–790 MHz is identified for IMT in Region 2 (5.317A) and some countries in Region 3 (5.313A). Subject to deliberations under WRC-15 Agenda item 1.2, 694–790 MHz will be identified for IMT in Region 1 from WRC-15 (Res. 232).</p>	<p>AMTA supports IMT identification in this band and notes that a sharing framework has been developed in Australia for Public Mobile uses.</p>
1300–1400	<p>1300–1350 MHz is designated to be used principally for the purposes of defence and national security. It is designated for use for aeronautical radar applications.</p> <p>1350–1400 MHz is allocated to radiolocation service which is designated for use by the Australian Defence Force and Department of Defence. It is used for both aeronautical and land-based radar applications.</p>	<p>AMTA supports IMT in this band but notes that a suitable sharing arrangement with existing and planned government services – based on either co-ordination or local band segmentation – would be required in Australia.</p>

Frequency Band (MHz)	Summary of current Australian Usage	AMTA view
1427–1518	<p>1427–1518 MHz is mainly used for point-to-point and point-to-multipoint fixed links, including for the delivery of public telecommunications to rural or remote areas.</p> <p>There is also some use by the Department of Defence, including both area-wide and location-specific assignments for fixed-receive, aeronautical-assigned system, aircraft-assigned, point-to-point and radiodetermination services.</p>	<p>AMTA generally supports IMT in this band – noting that little (if any) digital satellite broadcasting has emerged to date in the segment 1452-1492 MHz anywhere in the world, despite its availability for many years.</p>
1518–1559	<p>1518–1535 MHz is used for point-to-point and point-to-multipoint fixed links, including for the delivery of public telecommunications to rural or remote areas.</p> <p>1525–1559 MHz is designated for use for mobile-satellite service downlink, including for maritime and aeronautical applications.</p> <p>1544–1545 MHz is used for the Global Maritime Distress and Safety System (GMDSS) for distress and safety communications, including the relay of EPIRB signals.</p> <p>At WRC-07, 1518–1525 MHz was identified for use by administrations wishing to implement the downlink satellite component of IMT.</p>	<p>AMTA notes that there are existing and planned Mobile satellite services in this band; however there may be some potential to consider IMT services below 1525 MHz.</p>

Frequency Band (MHz)	Summary of current Australian Usage	AMTA view
1626.5–1660.5	<p>1626.5–1660.5 MHz is designated for use for mobile-satellite service uplink, including for maritime and aeronautical applications.</p> <p>1600–1660.5 MHz is used for radioastronomy applications at Parkes and Narrabri.</p>	AMTA does not support IMT in this band due to existing and planned Mobile satellite services.
1668–1675	<p>1668–1670 MHz is used for radioastronomy applications at Parkes and Narrabri.</p> <p>At WRC-07, 1668–1675 MHz was identified for use by administrations wishing to implement the uplink satellite component of IMT.</p>	AMTA does not support IMT in this band due to existing and planned Mobile satellite services.
1695–1710	<p>1695–1710 MHz is designated for use for meteorological-satellite service downlink.</p> <p>1702–1710 MHz is used for low to medium capacity fixed point-to-point links, primarily in areas not covered by the upper adjacent band spectrum licences.</p>	AMTA believes that the available bandwidth is too small to support IMT requirements.

Frequency Band (MHz)	Summary of current Australian Usage	AMTA view
2025–2110	<p>2025–2110 MHz will be used for television outside broadcasting from 1 November 2013 (and 1 January 2016 in the Perth area).</p> <p>2025–2110 MHz is designated for use for space operation, Earth-exploration satellite and space research space-to-space communications and uplink communications with a number of Earth stations located around Australia.</p> <p>2025–2110 MHz is used for medium capacity fixed point-to-point links, primarily in areas not covered by the upper adjacent band spectrum licences.</p>	<p>AMTA supports IMT in this band (or a portion –e.g. 2090-2110) but recognises that sharing with existing and planned services (including TOB and space operations) will need to be developed – based on either co-ordination or domestic segmentation of the band in Australia. AMTA notes that the band is already shared with fixed links, and is aware that sharing studies are underway for submission to the next meeting of the JTG.</p>
2200–2290	<p>2200–2290 MHz will be used for television outside broadcasting from 1 November 2013 (and 1 January 2016 in the Perth area).</p> <p>2200–2290 MHz is used for medium capacity fixed point-to-point links.</p> <p>2200–2290 MHz is designated for use for space operation, Earth-exploration satellite and space research space-to-space communications and downlink communications with a number of Earth stations located around Australia.</p> <p>2200–2290 MHz is used for Department of Defence aeronautical mobile telemetry systems.</p>	<p>AMTA supports IMT in this band (or a portion – e.g. 2200-2215 MHz) but recognises that sharing with existing and planned services (including TOB and space operations) will need to be developed – based on either co-ordination or domestic segmentation of the band in Australia. AMTA notes that the band is already shared with fixed links, and is aware that sharing studies are underway for submission to the next meeting of the JTG</p>

Frequency Band (MHz)	Summary of current Australian Usage	AMTA view
2700–2900	2700–2900 MHz is mainly used for radiodetermination services by AirServices Australia (primary surveillance radar), Bureau of Meteorology (weather watch and wind-finding radars) and Defence (military radar).	AMTA supports IMT in this band but recognises that existing and planned radiodetermination services may need to be replanned/re-stacked in Australia to allow domestic segmentation of the band. AMTA further notes that there is potential to clear most of the 2700-3100 MHz band by migrating and rationalising radar use as a longer term objective and AMTA would support such a long-term approach.
2900–3100	2900–3100 MHz is mainly used for radiodetermination services for maritime and defence applications.	AMTA supports IMT in this band but recognises that existing and planned radiodetermination services may need to be replanned/re-stacked in Australia to allow domestic segmentation of the band. AMTA further notes that there is potential to clear most of the 2700-3100 MHz band by migrating and rationalising radar use as a longer term objective and AMTA would support such a long-term approach.
3300–3400	3300–3400 MHz is allocated to the radiolocation service which is designated for use by the Australian Defence Force and Department of Defence.  There is also some amateur service use of this band on a secondary basis.	AMTA supports IMT in this band but recognises that existing and planned government services may prevent early access in Australia. AMTA notes that there is potential to clear most of the 3300-3400 MHz band by migrating and rationalising radar use as a longer term objective and AMTA would support such a long-term approach.

Frequency Band (MHz)	Summary of current Australian Usage	AMTA view
3400–3600	<p>3400–3600 MHz is allocated to the radiolocation service which is designated for use by the Australian Defence Force and Department of Defence.</p> <p>3425–3442.5 MHz/3475–3492.5 MHz is spectrum licensed in certain major cities and towns and primarily used for fixed wireless access. In areas not subject to spectrum licensing it is primarily used for point-to-multipoint services.</p> <p>3442.5–3475 MHz/3542.5–3575 MHz is spectrum licensed in certain regional and urban areas and primarily used for fixed wireless access.</p> <p>3575–3600 MHz is used for fixed point-to-multipoint broadband wireless access services.</p> <p>3590–3600 MHz is used for digital high-capacity long-haul fixed point-to-point links.</p> <p>3400-3600 MHz is designated for fixed-satellite service downlinks on a secondary basis, with a small number of Earth stations licensed in a small number of locations.</p> <p>There is also some amateur service use of this band on a secondary basis.</p> <p>3400–3600 MHz is identified in several countries of different Regions for IMT.</p>	<p>AMTA supports IMT identification in this band and notes that a sharing framework has been developed in Australia for Public Mobile uses.</p>

Frequency Band (MHz)	Summary of current Australian Usage	AMTA view
3600–3800	<p>3600–3800 MHz is used for fixed-satellite service downlink with a number of Earth stations licensed across Australia.</p> <p>3600–3700 MHz is used for fixed point-to-multipoint broadband wireless access services.</p> <p>3600–3800 MHz is used for digital high-capacity long-haul fixed point-to-point links.</p>	<p>AMTA notes that there is an existing framework to accommodate IMT up to 3700 MHz – but there are existing fixed satellite services licensed above 3700 MHz making the segment 3700-3800 MHz an unlikely candidate for IMT use in the short-term.</p> <p>However, AMTA believes that there is potential merit in the consideration of the deployment of small IMT cells in urban/suburban areas using this band.</p>
3800–4200	<p>3800–4200 MHz is used for fixed-satellite service downlink with a number of Earth stations licensed across Australia.</p> <p>3800–3870 MHz and 3910–4290 MHz are used for digital high-capacity long-haul fixed point-to-point links.</p>	<p>AMTA does not support IMT in this band due to existing terrestrial fixed point-to-point links and Fixed satellite services.</p>
4400–4800	<p>4400–4800 MHz is designated to be used principally for the purposes of defence and national security. It is used for applications including aeronautical telemetry, UAV systems, weapons systems and tropospheric scatter systems.</p> <p>4490–4690 MHz and 4790–4800 MHz are used for fixed point-to-point links.</p>	<p>AMTA supports IMT in this band but notes that existing government services may prevent its use in Australia.</p>

Frequency Band (MHz)	Summary of current Australian Usage	AMTA view
4800–5000	<p>4800–4990 MHz is allocated to fixed and mobile services which are designated for use by the Australian Defence Force and Department of Defence. It is used for both aeronautical and land-based radar applications.</p> <p>4800–4990 MHz is used for fixed point-to-point links.</p> <p>4940–4990 MHz is designated for use by public safety agencies as a public protection and disaster relief band for extremely high capacity, short range, deployable data and video communications</p> <p>There is also some use of this band for radio astronomy services at Parkes and Narrabri.</p>	AMTA supports IMT in this band but notes that existing government services may prevent its use in Australia.
5350–5470	<p>5350–5470 MHz is designated for use for airborne weather radar.</p> <p>There is also some use for radiodetermination services by the Department of Defence.</p>	AMTA supports IMT in this band but notes that existing and planned government services may prevent its use in Australia.

Frequency Band (MHz)	Summary of current Australian Usage	AMTA view
5725–5850	<p>5725–5850 MHz is allocated to the radiolocation service which is designated for use by the Australian Defence Force and Department of Defence.</p> <p>5725–5850 MHz is designated for a range of low interference potential devices (LIPD) including digital modulation transmitters and frequency hopping transmitted. A range of applications make use of this band including Wi-Fi and WiMAX applications, RFID, radiodetermination applications such as for distance/speed measurement, movement detectors, traffic monitoring and e-toll collection.</p> <p>5720–5850 MHz is designated for industrial, scientific and medical (ISM) applications.</p> <p>5735–5795 MHz is used for fixed point-to-point backhaul links in locations away from certain major towns and cities and regional areas.</p> <p>There is also some amateur service use of this band on a secondary basis.</p>	AMTA supports IMT in this band but notes that existing and planned government services may prevent its use in Australia.

<b>Frequency Band (MHz)</b>	<b>Summary of current Australian Usage</b>	<b>AMTA view</b>
5850–5925	<p>5850–5875 MHz is used for designated a range of low interference potential devices (LIPD) including RFID transmitters. A range of applications make use of this band including RFID, radiodetermination applications such as for distance/speed measurement, movement detectors, traffic monitoring and e-toll collection.</p> <p>5850–5875 MHz is designated for industrial, scientific and medical (ISM) applications.</p> <p>5915–5925 MHz is used for medium and high-capacity fixed point-to-point links.</p> <p>5850–5925 MHz is used for fixed-satellite service uplink with some Earth stations licensed in Australia.</p> <p>5850–5925 MHz is under investigation for use for intelligent transport systems.</p>	<p>AMTA notes there are existing and planned fixed satellite services in this band making it an unlikely candidate for IMT use.</p> <p>However, AMTA believes that there is potentially merit in consideration of the deployment of small IMT cells in urban/suburban areas using this band. Further sharing studies would be required in this approach was to be considered.</p>
5925–6425	<p>5925–6425 MHz is used for medium- to high-capacity, medium- to long-haul fixed point-to-point links.</p> <p>5925–6425 MHz is used for fixed-satellite service uplink with Earth stations licensed in Australia.</p>	<p>AMTA notes that there are existing and planned fixed satellite services in this band making it an unlikely candidate for IMT use.</p> <p>However, AMTA believes that there is potentially merit in consideration of the deployment of small IMT cells in urban/suburban areas using this band. Further sharing studies would be required in this approach was to be considered.</p>

<b>Frequency Band (MHz)</b>	<b>Summary of current Australian Usage</b>	<b>AMTA view</b>
6425–6725	<p>6425–6725 MHz is used for digital high-capacity long-haul fixed point-to-point links.</p> <p>6425–6725 MHz is used for fixed-satellite service uplink with Earth stations licensed in Australia.</p>	<p>AMTA notes that this band has not been studied in ITU-R for IMT but certain administrations have indicated their opposition to IMT due to interference with FSS. AMTA suggests that further study is required before this band can be properly considered.</p>

## Conclusion

AMTA welcomes the opportunity to comment on the Outlook.

AMTA considers the Outlook to be an important integral step in the process of defining a spectrum policy framework for Australia.

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