Getting the most out of the digital dividend in Australia

Allocating UHF spectrum to maximise the economic benefits for Australia

April 2009

1 Executive summary

1.1 Introduction

The Australian Mobile Telecommunication Association (AMTA) engaged Spectrum Value Partners[1] and Venture Consulting (referred to throughout as "Value Partners") to determine the net economic benefit generated by redeploying the UHF (700MHz) spectrum freed up by the switch-off of analogue television (ASO). This is usually referred to as the 'digital dividend'.

Specifically, the study provides policy makers with a clear indication of the expected economic benefit that would be generated by allocating a portion of this digital dividend UHF spectrum to mobile services rather than to digital TV services.

It identifies the optimal UHF spectrum allocation between mobile and broadcasting services such that net economic benefit to Australia is maximised on a 'whole-of-market' basis. The study takes account of the current and future spectrum environment as well as expected developments in mobile and broadcast technology.

AMTA's members have assisted us through the provision of proprietary data on a confidential basis. However, the assumptions and analysis contained within this report represent Value Partners' independent view.

1.2 Key findings

The study concludes that significant incremental economic benefit would be generated by allocating a portion of the digital dividend UHF spectrum to mobile services under each of four different overall market scenarios:

- Allocating the optimal mix of UHF spectrum to mobile operators is forecast to generate a net benefit to the economy of between $7bn and $10bn[2], depending on which overall market scenario is realised
- Where mobile broadband is a ubiquitous part of the broadband access mix, the maximum net economic benefit to society will be realised if 120MHz of usable UHF spectrum is allocated to mobile services
- In rural areas, where population density is lower, the propagation characteristics of the 700MHz spectrum are more critical for mobile coverage. As a result, the maximum net economic benefit under the same scenario will be realised with an allocation to mobile of 140MHz of usable spectrum

1.3 Key assumptions

A number of key assumptions underpin the Cost-Benefit Analysis:

- Mobile operators are assumed to continue to have access to their existing spectrum allocations and to gain access to the 2.6GHz spectrum band as planned globally
- The mobile broadband market is assumed to remain competitive such that economic benefit will be efficiently allocated between producers and consumers. For example, if only one or two mobile operators are awarded UHF spectrum, price levels might be higher than if three or four operators are awarded spectrum
- Over time it is assumed that new broadcast technologies will be deployed to ensure spectrum allocated to broadcast services is used efficiently
- A conscious effort has been made to ensure that the study does not favour the mobile industry. Therefore, when in doubt, the study deliberately favours broadcasters when defining assumptions and methodologies. As a result, we believe that the study results are conservative from the perspective of mobile operators.

[1] Spectrum Value Partners, formerly known as Spectrum Strategy Consultants and now part of the Value Partners Group
[2] Throughout this study, all benefits are measured over a 20-year period between 2008 and 2028 with a terminal value applied. The Net Present Value (NPV) represents the sum of the annual benefits, discounted to current prices

1.4 Our approach

Our analysis is based on a Cost-Benefit Analysis (CBA), which is a well established approach employed by governments in guiding policy. The CBA compares the net economic benefit generated by allocating different combinations of digital dividend UHF spectrum to mobile and broadcast services.

1.4.1 Mobile analysis

For the purpose of this study, we have defined mobile broadband as broadband services delivered wirelessly via the mobile network to laptops, mobile phones and other mobile devices.

The demand for mobile broadband services is calculated at a market level. The optimal market structure is not something that we seek to establish in this study. The CBA assumes that the market is competitive and that reductions in costs are passed on to consumers as reductions in price.

To forecast customer demand for mobile broadband services, we have drawn on existing research, proprietary data from stakeholders, and internal Value Partners analysis. We have benchmarked our results against existing studies forecasting future mobile broadband demand.

We have developed three mobile scenarios. The following exhibit summarises the key characteristics of the scenarios.

Exhibit 1: Mobile scenarios

Trend	Mobile ubiquitous	Mobile complementary	Mobile supplementary
Consumer behaviour	• Mobile broadband usage is widespread. It is a ubiquitous service, with an increasing number of consumers accessing broadband primarily through mobile networks[3]. However, fixed networks remain important for on-site use (e.g. for IPTV)	• Consumers use mobile broadband as a complementary service to fixed, recognising the benefits of mobility.	• Consumer continues to use fixed broadband as the primary mode of access. Mobile broadband is emerging as an option for supplementary use
Technology	• Peak speeds improve dramatically • Vast majority of portable devices are mobile broadband enabled • Desirable mobile broadband applications generate boom in mass market adoption.	• Peak speeds improve quickly • Handsets converge with ultra-portable laptops in functionality • Mobile broadband applications becoming more widespread	• Peak speeds improve steadily • Handsets evolve to facilitate increased data usage • Mobile broadband applications emerging and only used by early adopters
Commercial plans	• Generous unlimited data bundles are standard	• Unlimited data bundles introduced in the near term	• Tariffs remain on per MB basis in the short term, before moving to bundles

We have to make assumptions about industry structure when we consider the supply-side issue of how spectrum is utilised. We take a representative industry structure across Australia, based on the current market.

[3] Note: While it is expected that there will be some mobile-fixed substitution from a consumer perspective, fixed networks remain critical for ubiquitous consistent quality of service and scalability

The net economic benefit generated by allocating digital dividend UHF spectrum to mobile is calculated by determining the difference between the total benefit generated under each of the mobile scenarios and the benefit if no UHF spectrum is allocated to mobile.

1.4.2 *Broadcast analysis*

The broadcast component of the CBA assumes that a maximum of 300MHz UHF spectrum is available to digital TV (from 520MHz to 820MHz) and that a further 20MHz of VHF is also allocated to digital TV services[4]. We modelled a range of different digital terrestrial television (DTT) service mixes, taking account of spectrum availability and the likely evolution of broadcasting technology. The net economic benefit generated by broadcast services is based on the different costs and benefits to broadcasters and to viewers of providing a broader range of services via DTT.

We developed two broadcast scenarios based on variations in the assumptions that underpin much of the net benefit generated by broadcast services: advertising revenue as a proxy for the producer benefits enjoyed by advertisers and 'willingness to pay' (WTP) as a proxy for the consumer benefits enjoyed by viewers. For advertising revenue, we have assumed it will be correlated with overall Australia economic growth. For willingness-to-pay, we have benchmarked our assumptions based on both local and overseas surveys conducted.

The exhibit below shows our assumptions for the two potential broadcast scenarios: 'Free-to-air (FTA) market conservative' and 'FTA market aggressive'. In the conservative scenario, FTA advertising is expected to grow at 75% of historic levels and consumer's willingness to pay for free to air services is estimated to be lower than in our European study, based on available data. Our FTA market conservative scenario illustrates what we expect to be the more likely outcome whereas the FTA market aggressive scenario seeks to model the best outcome for broadcasters in Australia.

Exhibit 2: Broadcast scenarios

Trend	FTA market conservative	FTA market aggressive
Advertising revenue growth	• Taken to be 75% of Australian GDP growth forecast, which is forecast to be 5%pa. We believe this forecast is aggressive especially give the current economic climate	• Taken to be in-line with Australian GDP growth
Willingness-to-Pay[5]	• Taken to be 47.5% of Value Partners' European analysis[6], on the basis of Australian survey data[7,8]	• Taken to be the same as used in the equivalent Value Partners' European CBA study

The net economic benefit generated by allocating incremental digital dividend UHF spectrum to digital TV services is calculated by comparing the net benefit generated by additional services over and above those already planned.

[4] It is possible that DAB might also share a portion of the VHF Band III. However, as this is not confirmed by government policy at this time, we cannot assume allocation of the entire 58MHz of VHF Band III for Digital TV use. We take a conservative approach to mobile and hence allocate 20MHz of VHF Band III spectrum to broadcasting in our modelling.
[5] Willingness-to-pay is the theoretical price a consumer is willing to pay for a service or product, which in this case is FTA television
[6] *Getting the most out of the digital dividend*, March 2008, Value Partners
[7] Empirical evidence on willingness-to-pay for public broadcasting is in Glenn Withers, David Throsby and Kaye Johnston, Public Expenditure in Australia, EPAC Commission Paper No. 4, Canberra
[8] The National Social Science Survey, carried out in 1999 and made available to Professor Glenn Withers of the ANU in March 2000

1.5 Overall Results

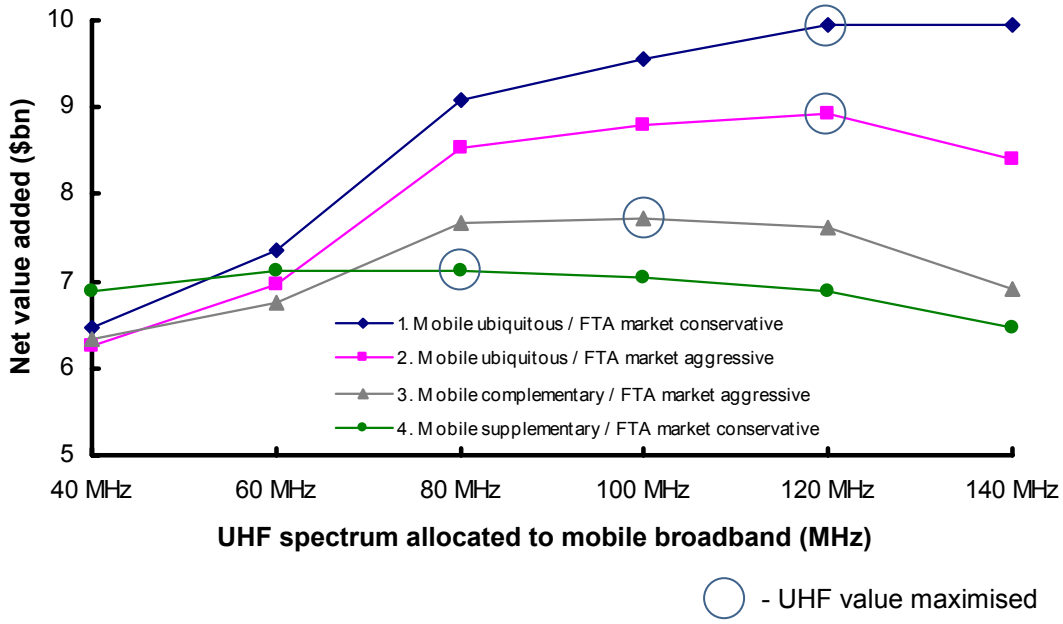
The CBA forecasts that under four overall market scenarios (combining the mobile and broadcast scenarios) the net benefit to the Australian economy of allocating the optimal UHF spectrum to mobile services will be between $7bn and $10bn.

Under the overall market scenarios based on the 'mobile ubiquitous' scenario, the optimal allocation of digital dividend UHF spectrum to mobile services is 120MHz of usable spectrum, regardless of the broadcasting scenario selected. Under the reduced mobile scenarios ('mobile complementary' and 'mobile supplementary'), the CBA suggests an optimal allocation of between 80MHz and 100MHz to mobile services, so long as this does not result in any overall lessening in competition.

If each of the four overall market scenarios considered is equally likely to occur, the risk-weighted optimal allocation of digital dividend UHF spectrum to mobile services is 120MHz of usable spectrum.

The exhibit below illustrates the net value added to the Australian economy by allocating a varied amount of the digital dividend UHF spectrum for mobile broadband services under different overall market scenarios.

Exhibit 3: Net value added – national ($bn)



The CBA also considered the optimal allocation of spectrum on a rural and metropolitan basis given the current broadcast licence allocations. For rural, due to lower population density, the propagation properties of 700MHz spectrum is more significant. As a result, the optimal allocation of digital dividend to mobile is higher, ranging from 80MHz to 140MHz, and the net economic benefit is $4bn to $5bn, depending on the overall market scenario.