

**Paul Fletcher, Parliamentary Secretary to the Minister for
Communications**

Speech to 'Australasia Satellite Forum 2014'

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Introduction

I am very pleased to join you at the 2014 Australasia Satellite Forum.

There is no doubt that satellite communications has a special importance in a country as enormous – and in many places as lightly populated – as Australia.

Over ten years ago, as an Optus executive, I saw a very powerful demonstration of this, at the launch of a School of the Air application delivered over the Optus satellite.

As part of the launch, we visited a customer's premises – some two hours drive east of Alice Springs. There we watched a ten year old boy doing his lessons on a computer, watching a live video broadcast of his teacher.

In the corner of the room there was a boxy old VHF radio set – which he had been using until just a few weeks earlier.

It was a powerful – and moving – demonstration of how improved communications services can change lives for people in remote Australia, in this case through giving a young boy a vastly richer educational experience.

Today I want to reflect on the three 'P's of public policy concerning satellite: its potential; its perils; and what is good practice.

I will start with the potential – thanks to satellite's superior economics in remote locations.

Next I want to talk about the perils – looking at both AUSSAT in the eighties and NBN some thirty years later.

Finally I want to talk about good practice – and what the Abbott Government is now seeking to do in satellite communications.

The Potential of Satellite

Let me turn first, then, to potential.

Almost as soon as the first satellites were launched – the Soviet Union’s Sputnik 1 in 1957, followed by the USA’s Explorer 1 in 1958 – people began to see the potential of satellite for communications with places that would otherwise be virtually impossible to reach economically with terrestrial infrastructure.

Australia was an early participant in international organisations like Intelsat and Inmarsat.¹ But by the late seventies there was a growing appetite to have our own satellites.

The *1979 National Communications Satellite System Working Group Report* concluded, amongst other things, that

A significant proportion of the existing 10,000 manual telephone subscribers in outer rural areas could be provided with automatic telephony, television and radio broadcasting services by satellite at a cost significantly less than that required to produce the same services by terrestrial means.²

Some thirty years later, much the same issues were considered by the McKinsey/KPMG Implementation Study - commissioned by the Rudd

¹ National Communications Satellite System, Working Group Report, August 1979, p1

² National Communications Satellite System Working Group Report, p xiv

Government to retrospectively fill in the details after announcing its hastily conceived NBN policy.

The Implementation Study observed that:

Satellite services will continue to be important for providing broadband in the future due to the prohibitive cost of serving lowest-density areas with other technologies.³

Both reports are making the point that satellite is the cheapest way of serving very remote locations.

But satellite is not cheap in an absolute sense; in fact on a per customer basis it is very expensive. For example, it costs around \$7,300 per user to deliver services via NBN Co's Interim Satellite Service (ISS).⁴

Satellite's real merit is that while it might be high cost, that cost remains unchanged regardless of location.

A fixed network, whether copper or fibre, has a low per customer cost in high population density areas but it rises very quickly as population density falls; and wireless sits somewhere in the middle.

To quote the Implementation Study:

Unlike fibre and wireless, a satellite solution has a large fixed cost...but if spot beams provide national coverage there is no incremental investment to serve additional premises other than in CPE⁵

Therefore as you move to lower and lower population density areas, first wireless and then satellite become the economically preferred technologies.

³Implementation Study for the NBN, March 5, 2010, page 290.

⁴ <http://www.theaustralian.com.au/business/in-depth/nbn-fix-costing-7300-per-user/story-e6frgaif-1226838630755>

⁵ Implementation Study for the NBN, March 5, 2010, page 279-280.

Given these fundamental economics, the Coalition has always acknowledged that the choice of wireless and satellite as technologies for NBN Co to use in serving regional and remote Australia is sensible.

And the Coalition has demonstrated by its actions, as well as its words, an understanding of the contribution satellite can make. For example, in 2007, the Howard Government introduced the Australian Broadband Guarantee targeting homes and small businesses that did not have metro-comparable access, and providing subsidies for costly satellite access.

The Perils of Satellite

Given the potential of satellite as I have discussed, governments tend to approach satellite rollouts with enthusiasm. Sadly, that enthusiasm does not always end well – for satellite poses many perils for communications policy makers. Let me discuss three: financial, operational and pricing.

Financial Risk

The Aussat experience of the 1980s is a powerful example of the financial risks to which a government-backed satellite venture is exposed.

The decision to establish Aussat in 1981 followed the 1979 report I quoted earlier, which concluded that if such a venture was to proceed it would need to be government funded:

For a number of reasons, it appears that there is little prospect at the current time of any private sector funding of the space segment of a national satellite communications system, and that the burden of funding could fall to the public sector.⁶

⁶ National Communications Satellite System, Working Group Report, August 1979, p102

By 1987 AUSSAT had launched three satellites, with the intention of supplying communication services for consumer and military purposes, as well as television services to remote regions.⁷

AUSSAT faced technical and financial difficulties from the outset.

Between 1981 and 1991 there was only one year in which it managed to make a profit.⁸ By the early nineties it had debts of \$800 million and was clearly unsustainable.

This was a tricky problem for the Hawke-Keating Government –eventually solved when it issued a second telecommunications licence as part of the reform process of the early 1990s. This licence was a valuable and attractive asset, but it came with a condition: the requirement to take over AUSSAT.

The government raised \$800 million from the issue of the second licence – but was required to pay \$799 million to clear AUSSAT’s accumulated debts before the transaction proceeded.⁹

No doubt informed by this sad history, the 2009 Implementation Study was clear in its recommendation: it would not be a good idea for NBN Co to own and operate its own satellites.

Instead, it suggested a leasing model utilising third party satellite infrastructure, on the grounds that:

a leasing model avoids large upfront investments and enables NBN Co to adjust capacity to demand flexibly, within the limits of agreed contract conditions.¹⁰

⁷ Paul Budde report into high-speed satellite services, 2013

⁸ Parliament of Australia, Joint Committee of Public Accounts, Report 333: The Sale of Aussat, September 1994, pp 6-7

⁹NBN a repeat of AUSSAT fiasco, The Australian, Feb 25 2011, <http://www.theaustralian.com.au/opinion/nbn-a-repeat-of-aussat-fiasco/story-e6frg6zo-1226011604991>, downloaded 15/5/14

But Senator Conroy – with the support of eager empire builders at NBN Co – was convinced he knew best. He decided that NBN Co should blithely plunge into the complex challenge of owning and operating its own satellites.

Hence in February 2012, NBN Co announced that it had signed a contract with Space Systems/Loral for the delivery of two, next-generation Ka-band satellites and associated tracking, telemetry and control systems.¹¹

Operational Risk

As the AUSSAT experience shows, owning and operating satellites involves huge financial risk. But as I hardly need remind this audience there is also enormous operational risk – especially early in the life of a satellite.

NBN Co’s recently released Fixed Wireless and Satellite Review highlights two of the most serious risks the company’s satellite program faces: launch failure and on-orbit failure.¹²

For those not familiar with the satellite industry, it can be difficult to understand that after spending hundreds of millions of dollars to build and launch a satellite, there is a non-trivial risk that the satellite will blow up on launch.

Of course it is relatively unlikely that this risk will materialise. But other risks, while less catastrophic, can also cause problems – for example a delay in the build and launch timetable.

The Fixed Wireless and Satellite Review revealed that the NBN Co spacecraft build and launch timetable has very little remaining contingency time available,

¹⁰ Implementation Study for the NBN, March 5, 2010, page 296.

¹¹http://pandora.nla.gov.au/pan/80090/201309181430/www.minister.dbcde.gov.au/conroy/media/media_releases/2012/011.html

¹² Fixed Wireless and Satellite Review, p 36

relative to what other satellite programs would typically have at this stage of the build.¹³

NBN Management has taken a prudent decision, following the Review, to move the target date for the activation of the first NBN long term satellite to the first quarter of 2016.

As the Review also highlighted, a number of decisions taken under the previous government have contributed to the risk of delay – particularly the fact that the satellites NBN is buying are both novel and complex in design.

They are the first Ka- band satellites serving the Australian market, and in addition are very complex in design due to the large number of beams (101) per satellite.¹⁴

The Review report points out that in programs of this nature, industry evidence suggests delays of between 3-6 months are not unusual.

Misunderstanding the economics of satellite

The third big risk, which bedevils government-backed satellite ventures, is the risk of mis-pricing services – typically due to a misunderstanding of the economics of satellite.

In the case of Aussat, the problem was that prices were simply too high for the market to bear. To quote from an article by Peter White, a communications analyst who has closely studied Aussat's history,

The \$1000 television and radio ground stations promised by the government cost much more than expected...The School of the Air and its clients struggled to purchase the expensive equipment needed for two-way

¹³ Fixed Wireless and Satellite Review, p 10

¹⁴ Fixed Wireless and Satellite Review, p 112

communications...Predicted revenues were not achieved and AUSSAT generated large losses.¹⁵

In the case of NBN, a different but equally serious mistake was made – a failure to understand the importance of setting prices and packages in a way which would most fairly allocate the finite capacity on the satellite.

Here I am specifically referring to the grave mismanagement of the Interim Satellite Service, or ISS, which was announced with great fanfare by the Labor Government in 2012. This was promised to offer a 6 Mbps download speed.

To provide the service, NBN Co leased capacity on satellites owned by two existing operators, Optus and IPStar, at a cost of \$351 million.

The former Communications Minister, Stephen Conroy informed the nation that 250,000 households were eligible for the ISS – but NBN Co only purchased enough capacity for 48,000 users.

As a consequence of NBN Co's mismanagement, the end user experience has increasingly degraded, as some retail service providers and a minority of heavy users have evaded the 'fair use' policy by downloading large volumes of data and leaving very little capacity available for other users.

The result has been that at peak times the customer experience is little better than dial up. Indeed, there are customers who report that they cannot even send an email. This is a terrible end user experience – and it is a terrible public policy outcome when the Commonwealth and ultimately taxpayers are paying a very large subsidy of approximately \$7,300 per service.

The root cause of the problem is that the interim satellite solution was designed with a network capacity allocation per end user of around 30 kilobits per second

¹⁵ NBN a repeat of AUSSAT fiasco, The Australian, Feb 25 2011, <http://www.theaustralian.com.au/opinion/nbn-a-repeat-of-aussat-fiasco/story-e6frg6zo-1226011604991>, downloaded 15/5/14

average busy hour throughput. This jargon term, familiar to those in the room but possibly not to others who may read this speech, is a measure of the average speed at which data is downloaded, across all end users in a satellite beam, over a period of time.

When you work through the maths, this equates to a bit over 9 gigabytes per month that each user is able to download.

Yet some retail service providers were selling plans to end users offering monthly downloads as high as 60 gigabytes.

In other words, the retailers had sold end users the right to download, in total, much more data per month than the satellite could actually carry.

This seems to have happened for a combination of reasons. First, NBN Co did not establish the proper tools to control - or even monitor - the total amount of data consumed by an individual retail service provider (or, more accurately, the customers of that RSP.)

This meant that if some RSPs did the right thing, and stuck to selling plans which were consistent with the actual amount of capacity available on the satellite, but others did not, then there was no way to police the non compliant RSPs. In turn, the actions of the non-compliant RSPs led to a degradation of the customer experience not just for their own customers but for all end users on that particular satellite beam.

But the second reason it seems to have happened is that NBN Co did not properly understand that the capacity limitations on satellite are fundamentally different to those on other networks such as fibre to the premises or fibre to the node.

It should have established pricing which would fairly allocate the available capacity amongst all end users – but it demonstrably did not do so.

Good Practice

I have spoken about both the potential – and the pitfalls – of using satellites to achieve public policy objectives. In the final part of my remarks I want to speak about good practice – and how the Abbott Government is applying this good practice in our approach to the use of satellite communications.

Recognise Where Satellite is Well Suited – and Where it is Not

The first priority is to recognise what satellite is well suited for – and what it is not well suited for – and to use it accordingly.

When we came to government, Minister Turnbull and I were startled to discover that some on the NBN Co Board seriously thought the fixed wireless rollout should be abandoned as it was all too hard, and NBN Co should launch a third satellite instead.

In my view, nobody with serious senior management experience in the telecommunications industry would entertain this belief. But of course such people were sorely lacking on the previous NBN board.

More generally, there was a widely held view in NBN Co that if they had originally planned to serve the customer with fibre or fixed wireless, but for some reason that now looked difficult, there was no need to worry because satellite would pick up the customer.

Unfortunately, while other parts of the company would rule a line through particular areas, their colleagues planning the satellite rollout were not necessarily told they were now responsible for these premises.

In the slightly more polite words of the Fixed Wireless and Satellite Review, NBN Co's 'functional siloed organisation...inhibited visibility and effective decision making across fixed wireless and satellite.'¹⁶

¹⁶ Fixed Wireless and Satellite Review, p 10

The Review recommends that in future NBN Co should take a very different approach, and put in place protocols to ensure that scarce satellite capacity is actively planned and ‘owned’ within the company. It specifically says that NBN Co should not rely on satellite technology as a ‘back-stop’ for other access technologies.

The Review also recommends that NBN Co strike a very different balance between satellite and wireless than was previously proposed: going from 39% of users on fixed wireless and 57% on satellite, to 57% of users on fixed wireless and 40% on satellite. This will require almost doubling the number of fixed wireless base stations from 1,400 to 2,700.

Importantly, this approach will mean that the scarce capacity on the satellite is reserved for the users who really need it – and who cannot practically be served by other technologies – and in turn ensure that there is sufficient capacity so that they receive a good quality user experience.

And it will avoid the \$600 million cost of a third satellite – for many years at least – allowing more spending instead on expanded fixed wireless capacity.

Have a Serious, Long Term Plan for Regional and Remote Communications Needs – With Satellite Playing Its Rightful Place

The second element of good practice for satellite policy, I would argue, is to fit satellite within a broader context of a serious plan for regional and remote communications needs.

The Coalition has always been more serious than Labor about communications services for regional and remote Australia. We represent the bulk of the regional and remote electorates in the Parliament and many of our parliamentarians – including some of our most senior ones – live outside of the capital cities.

When it comes to regional and remote communications, the Coalition has set out some clear priorities.

First, we want to optimise the operational performance of NBN Co's wireless and satellite businesses. Clearly, the company's fixed wireless and satellite review is an important step in this area.

For example, the Review identifies some clear actions to mitigate risk in the satellite program, including:

- Creating a dedicated team within the COO function to manage the operational scale-up of both the fixed wireless and satellite network operations; and
- Executing 14 specific actions that will help to further de-risk the satellite program – such as engaging experienced specialists in specific areas, and engaging with the installer industry more than 12 months in advance of the LTSS commencement to give them time to ramp up their field forces.¹⁷

A second priority is to speed up the rollout and deliver fixed line broadband services in more country towns which otherwise would have received only wireless. The review recommends that some 25,000 premises in regional towns could be served by high speed fibre to the node services - rather than either wireless or satellite. Again, this will help maximise capacity on the satellites for those premises which they do serve.

The third priority is to leverage the NBN build to better support mobile communications in regional and remote Australia, particularly by enabling co-location of both mobile and broadband equipment on the same tower.

Fourthly, we are giving specific funding support to extend mobile coverage in regional and remote Australia, under our policy to invest \$100 million to expand the mobile coverage footprint.

¹⁷ Fixed Wireless and Satellite Review, 19, 98, 99

Understand Capacity Limitations – and Don't Oversell

The next element of good practice is to design the NBN satellite product offerings with a good appreciation of the available capacity on the satellite.

Labor's approach was to pretend that satellite has the same capacity as a fixed service – and to seek to offer an identical service over satellite as over the other two networks. That simply will not work – as the interim satellite service fiasco has shown.

This issue is discussed extensively in the fixed wireless and satellite review, which recommends a network capacity allocation per end user of around 150 kbps¹⁸, as well as offering an upgrade plan for a higher charge which would provide higher capacity allocation and monthly download limit.

As well as getting things right on the long term satellite service, we are also working to improve the interim service. NBN is purchasing additional satellite capacity, so that what is allocated to each user will be boosted by around one-third.

Also, NBN Co will deploy new monitoring tools to better manage existing ISS capacity – and help prevent a small proportion of high volume users unfairly slowing the service levels of all other users.

And in coming months, we will commence a subsidy scheme to help up to 9,000 homes, farms and small businesses unable to access the ISS to purchase commercial satellite services, based on the Australian Broadband Guarantee scheme which operated effectively in the Howard Government years.

¹⁸ Fixed Wireless and Satellite Review, p 11: "All scenarios assume that NBN Co implements a standard product construct with a network capacity allocation per end-user of 150kbps on satellite when the network capacity is contended, given the limited capacity on the satellite. Note that network capacity allocation refers to the average of all data downloaded across all end-users in a satellite beam. It is quite different to peak speed and is consistent with a headline peak speed of 25Mbps."

Why Build a Business When You Can Buy Capacity

A fourth element of good practice is to avoid, where possible, owning and operating a satellite business, and instead seek to purchase satellite capacity from a specialist operator.

The Coalition has consistently said that we will consider opportunities to realise value from the satellite contract by seeking private operators or owners for the NBN satellite service, if this enables price and service levels for regional consumers to be improved.¹⁹

The Review considered this approach – but did not recommend it at this point, although it said NBN Co should remain prepared to evaluate acquisition or partnership proposals from private industry on their merits.²⁰ It also pointed out some other options including ways to commercialise any spare capacity on undersubscribed beams.

Of course the Review is giving the views of NBN Co. From a government perspective, we continue to be interested in the possibilities on this front if the issues raised in the Review can be overcome.

One is that at this stage any potential purchaser would be taking on the launch risk, and would probably require a significant price discount to compensate. While a successful launch would cure that problem, another problem is that the NBN satellite service loses money. Hence any private sector appetite is likely to depend on how much transponder capacity is not being used to serve the NBN customers, and hence could be monetised by a private sector operator.

¹⁹ NBN Rebooted: Speech for the Communications Alliance conference, 19 November 2013: <http://www.paulfletcher.com.au/speeches/other-speeches/item/979-nbn-rebooted-speech-for-the-communications-alliance-conference.html>

²⁰ Fixed wireless and satellite, p 17 and 49

Conclusion

Let me conclude by repeating the observation that Malcolm Turnbull made when launching the Coalition's broadband policy in early 2013.

If it were our choice, in trying to get to the policy objective of an improved broadband infrastructure, then in the words of the old Irish joke, we would not have started from here.

That is as true of the satellite network as of the other two networks. The lessons of the AUSSAT debacle are very clear – but Labor wilfully ignored those lessons in the decisions it took regarding satellite.

Some of Labor's mistakes – such as the hopelessly incompetent approach to allocating the finite capacity on the satellite – can be corrected. Others we are stuck with.

Nevertheless, we are determined to do our best to get the NBN rolled out in the most rational way possible – given where we started from.

When it comes to the satellite portion of the NBN, that means recognising the unique strengths of satellite and making sure we use it wisely in the locations where it has an advantage. It also means not trying to use satellite to serve customers that it is not well suited to serve.

That is the best way to bring sharply improved communications services to regional and remote Australians – and to continue to use satellites to transform lives as I saw in Alice Springs a decade ago.