

26 June 2007

Telstra Operations
Level 32, 242 Exhibition Street
Melbourne 3000

Dear

I am writing in my capacity as the Chief Technology Officer at Telstra to provide a number of observations about the capabilities of various broadband technologies that have been subject to widespread industry and media commentary following the Government's Australia Connected announcement on 18 June.

In a fact sheet on WiMAX that was released as part of the Australia Connected announcement it is stated that: *"This performance means that consumers will experience the same speed and quality of services on WiMAX as they would on wired services such as Cable and DSL."* I would like to take this opportunity to provide you with a number of pertinent facts so that you are fully aware of the real situation regarding this technology comparison.

First, in Telstra's original proposal to build a Fibre-to-the-Node (FTTN) network, we guaranteed customers a speed of 12Mbps (in our subsequent proposal we have increased this speed to over 20Mbps). We were able to provide this guarantee because by designing the node serving area to be of a constrained size, we can ensure the bit rate down the line received by each customer. WiMAX, by contrast, suffers a number of disadvantages that are inherent in all radio-based services. Advertised peak speeds (such as 6Mbps and later 12Mbps) are subject to the random variations that are endemic in radio systems. The number of customers who will actually achieve these speeds in the coverage area can be relatively low. The speeds achieved also depend on many factors such as the terrain, the foliage, rain, backhaul etc. And if customers are unlucky enough to be situated in the wrong location relative to the base station, they will receive a severely degraded speed, much less than the 6 and 12Mbps depicted on the coverage maps.

Furthermore, radio is a shared medium, so all users in the same area need to share that 6 or 12Mbps (or whatever happens to be available where the customer is). This is in contrast to FTTN or ADSL where each customer has a dedicated line. In a WiMAX environment, if people want to watch a TV program which runs at, say, 1.5Mbps, then no more than four homes out of the hundreds of possible homes in the area covered by the WiMAX cell can enjoy the service at the same time. While the WiMAX speeds referred to in the fact sheet may deliver relatively high speed internet services today, they will struggle to deliver the rich media (audio, video as well as web pages) that are literally coming down the pipe and will grow strongly over the next few

years. These are the services that will drive crucial benefits such as distance learning and tele-medicine.

In addition, as radio networks go, WiMAX is not, in my view, the best choice. There are two WiMAX standards which are incompatible with each other. We understand that the OPEL consortium proposes using the 'fixed WiMAX' variant which has been around for a few years with little uptake (a few networks and most reports say fewer than one million customers globally). By contrast the 3G standard utilised by Telstra's Next G™ network has 162 networks in 72 countries with over 115 million customers today.

More importantly, it is important to understand that this fixed WiMAX technology is an orphan, because it is about to be superseded by a yet to be deployed new standard called "mobile WiMAX". **Fixed WiMAX is incompatible with mobile WiMAX** and, as between these two standards, the latter standard is expected to prevail in the market. That means the fixed standard adopted by OPEL is an orphan - it has **no upgrade path and no future**. Further, the stated increase of speed from 6Mbps at commencement to 12Mbps by June 2009 does not mention whether this will require customers to replace or upgrade their existing modems and at what cost.

Even the mobile WiMAX standard, the preferred standard that the industry is focussing on, is expected to be a sideshow in the global scheme of things and is only expected to constitute about 5% of the global market in the next 3 to 5 years. By contrast, the technologies on which Telstra's Next G™ network are based, 3G with HSPA (which we chose after detailed research), are expected to constitute 85% of the global market in that period. On top of that, the mobile WiMAX standard is predominantly a data connectivity solution without the inherent capabilities of voice, messaging, roaming and handheld devices that we are familiar with today on mobile phones. Also the mobile WiMAX technology is completely unproven because no one has actually deployed a commercial service with this standard yet.

Obviously you will be interested in the WiMAX coverage range in rural areas. I note that the Australia Connected materials claim that WiMAX has a guaranteed minimum 20km range (with coverage as far as 50kms). I also note that the electorate coverage maps that have been produced and distributed under the Australia Connected logo appear to be drawn to show coverage in a fixed circular pattern around base stations with no account of local terrain or land use where hills or other obstruction would be expected to block or reduce signal performance.

Because of the high radio frequency used, for WiMAX to achieve comparable coverage to Telstra's 3G network (more than 98% of the population), I would estimate that OPEL will need to deploy more than four times the number of base stations. Yet the OPEL proposal is to deploy less than a quarter of the number of base stations Telstra has already deployed. In addition, while the WiMAX technology may have a theoretical limit of 50kms, this requires a clear line of site between the base station and the user's antenna. Realistic coverage ranges from the base station are likely to be much less than that. By contrast, in February Telstra upgraded its Next G™ network on selected sites to provide coverage up to 200 kilometres (with line of sight) from the base station.

It is also important to note that the OPEL press release refers to the use of public spectrum to deploy their solution. This may mean that WiMAX is susceptible to interference from WiFi users and other appliances as well as rain fade. Radio

technologies deployed in public spectrum also have strict power limits imposed on them by ACMA and our expectation is that the range of such solutions will be of the order of a maximum of 5 to 15 kilometres or less in most circumstances.

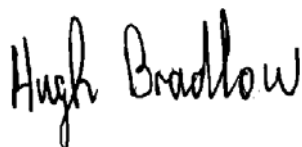
Backhaul is also an important factor in the speed and user experience when services are being delivered to remote areas. Should satellite backhaul solutions be used to provide backhaul for WiMax base stations there will be a number of technical issues associated with the satellite delay that could severely impact or degrade the customer experience. This could include noticeable delays before web pages begin to load, poor performance for VOIP and limits in data transmission speed that could be as low as 1 Mbps. In addition, I am not aware that satellite backhaul is compatible with 3G, which means that it will not be possible to extend a 3G network into these remote communities as would be able to occur with fibre backhaul.

Finally, just to emphasise, a radio network does not provide the same broadband capability as a fixed network. But, if you need to deploy radio technology, and there are some places for which this is necessary, you are far better off using the same radio infrastructure that you are already using for mobile services. That way you optimise the investment across all revenue sources. That is why Telstra will use its Next G™ network to provide fixed wireless services (with speeds that are just as good, or better than, WiMAX). In addition, unlike WiMAX, the Next G™ network comes with the voice and video telephony capability built in which again improves the economic efficiency. The WiMAX standard that OPEL proposes deploying cannot be used for mobile services, nor does it include as part of the infrastructure the telephony infrastructure for services such as making voice calls or sending messages.

I have taken the liberty of attaching three slides to this letter. The first is a national hand-held coverage map of Telstra's Next G™ network. The second is a national OPEL revised coverage map dated 5 June (which includes WiMAX). The third demonstrates the coverage range impact of deploying wireless solutions at various spectrum frequencies, noting that WiMAX will be deployed at a much higher frequency range than Telstra's Next G™ network.

I hope this letter and the attached slides assist in helping you understand the proposed OPEL wireless solution for regional Australia.

Yours sincerely

A handwritten signature in black ink that reads "Hugh Bradlow". The signature is written in a cursive style. To the right of the signature is a vertical red line.

Chief Technology Officer