

## **THE KIWIS GET FTTH WHY DOESN'T THE UK ?**

Peter Cochrane

I've recently been looking at New Zealand as a case study for fibre. What I've discovered is a visionary policy of putting fibre first so the country is ready for the future and is removing digital divide. Fibre in New Zealand is providing first class broadband and mobile coverage all around the country via the UFB (Ultra-Fast Broadband) and RBI (Rural Broadband Initiative) programs.

A simple, consistent policy of replacing FTTN (fibre to the node) with FTTH (fibre to the home) to 75% of the population, with an open access policy to everyone, backed up by rolling fibre deeper into rural to build new FTTN with a view to FTTH in the future. The fibre is then used to enable [complementary] mobile infill coverage in rural areas along the way.

The economic opportunity and advantage being afforded to cities, towns, communities and individuals by these networks cannot be overstated. New Zealand seems to be one of the very few countries around the world who really "get it" and are working to one clear vision - without fibre everywhere you will be left behind.

## **FIBRE IS THE FUTURE**

To understand just how important this all is for New Zealand it is necessary to appreciate some of the history and the current world position. The progress of personal computing, the internet, and mobility has been stellar. The global reach has touched every aspect of human life and society with new technologies made possible, industries created, and services that have shrunk the planet. Optical fibres also make it possible to connect every major country, city and town across the world. But for most of the planet, there it stopped. FTTH is progressing at a snails pace despite a very visible and increasing demand. Networks across most of the western world are now on the back foot - unable to meet demand or the service levels needed.

An almost pathological love of copper and mobile and fear of fibre seems to have gripped the telco industry from about 1990 onwards. National FTTH/P programs started in the late 80s were abandoned in the early 90s and the very long and expensive trek to continually squeeze more and more bandwidth out of copper cables and congested wireless waves got underway. 2, 2.5, 3 and 4G promised a fixed mobile utopia just over the horizon - just one more step, and then we won't need all this fibre - but they never delivered!

This has led to a necessary fixation on the 'peak promise' rather than the sustained throughput which is the key measure we should look at with latency close behind. Needless to say; none of these technologies delivered on their promise and as a result the majority of people currently suffer congestion and delay. As a result, many are disadvantaged by exclusion from services and world markets – forgetting the key philosophy behind network effects – we need everyone with great connectivity and connected to each other.

Of course there are exceptions to all this; Japan and Korea for example went ahead with fibre rich networks complimented by leading edge mobile technologies from 1990s onwards. In the decade that followed Scandinavia and some parts of Europe and USA saw a few incumbents, private companies and community networks starting to roll out FTTH/P. Today the realisation is dawning that copper and mobile networks can never fully deliver. FTTH with bandwidths of 1Gbit/s both ways is now assumed to be a base requirement to support future industries, commerce and government. You have to ask, how much more efficient and how further would we all be towards better connectivity and broadband if there had been one clear vision decades ago?

## **YOUR ECONOMY NEEDS FIBRE**

Without super-fast networks countries cannot compete in environments of Cloud Computing, the Internet of things, Smart Communities/Cities, Future Industry, HealthCare and Education. Without fibre, efforts to create sustainable societies will fail and wealth creation in a distributed and global

economy will falter. The future really is about connected people, machines, industries and facilities on a global scale.

Could there be more? It gets better! In every country and island that has installed FTTP we see a rapid rise in services and bandwidth use including the displacement of travel by tele-conferencing. We also see new businesses migrating to FTTP connected countries and regions to empower new tech centres, with education and healthcare services benefitting greatly. In addition, telcos become far more profitable and able to invest in broader portfolios and the national GDP rapidly exhibits a significant upturn.

Moving from copper to glass (optical fibre) facilitates an 80 - 90% reduction in the number of network buildings required. We also see an 80-90% reduction in the number of faults which delivers an even greater reduction in the number of repair crews and truck rolls. Greater reliability and resilience with network energy use also reduced by 80 - 90%. But perhaps more importantly, the network is future proofed for decades to come as bandwidth is effectively infinite by today's measures. And by installing WiFi and 4G/5G wireless at micro and pico-cells terminated on FTTH/P we realise short hop, low energy, infill that the planet can afford!

Technology is not going away, it is accelerating, empowering new industries and invoking positive change, and we have to be in the race. AI, SuperComputing, Big Data, Security, Sensors, Scanners, Genetics, Proteomics, Bio and NanoTech et. al. are where the tech revolution is happening, but not without the bandwidth and connectivity that optical networks can furnish. Our world is no longer flat, slow, local and constrained, it is global, connected and dynamic with rapidly evolving business, creativity, collaboration, management and commercial models.

### **HYPING IT UP WITH 5G MOBILE**

But isn't 5G mobile the answer? When people claim that 5G is our broadband future and we don't need the expense of optical fibre it is generally because they believe the commercial hype, or they

don't understand the limitations of wireless technology, or even worse, they have a vested interest and a hidden agenda. Not only will 5G fall short of what is demanded today, it cannot satisfy our future communication and ecological demands either! Unlike 3 and 4G, 5G is not a singular product built to the same standard! It is a range of concepts and ideas devoid of any international agreement until at least 2020 or so. Chances are companies and countries will select different technology options under the same 5G label and there will be little uniformity. And what community is going to sanction a 10 fold or more increase in the number of towers, because that is what is required to deliver on the hype.

Across the developed world mobile systems carry around 5% of the internet traffic, with WiFi supporting 50% or so. The remainder is carried on wired links such as office and home LANs. How come? Mobile networks cannot supply ubiquitous coverage, sufficient connectivity, or indeed enough bandwidth to meet demand. Without examining the technical detail of why, we might observe that 2G,3G and 4G did not deliver, so why would we expect 5G to do so? The progression from 1G through 5G has occurred in 8 - 9 year intervals more or less using the same towers or sites with infill provided by smaller rooftop and building installations. For 5G to deliver on the promise we will need thousands more cell sites, and then in 8-10 years we'll repeat the experience again for 6G!

As of today the internet including all our mobile and fixed devices consumes an estimated 5-10% of all the energy we generate on the planet. And we are about to move up from over 10Bn computing devices, and 7Bn mobiles, to a world of the IoT with another 50 - 250Bn wireless things on line. The mobile community would love to connect everything, but clearly that cannot be given our growing use of energy and their inability to satisfy the need. No matter how you try you can't beat the laws of physics and we have to turn this situation around. We have to find far less energy consuming strategies for mobility and the IoT. Fortunately we have the opportunity to drastically reduce energy demands by exploiting the inverse square law for electro-magnetic waves. This dic-

tates that halving the path length of a wireless link reduces the required transmitter power to just one quarter, whilst a 100 fold path reduction sees systems move down from Watts to micro-Watts.

Here then is a workable solution! More wireless connections dictates many more tiny nodes with optical fibre connections at a far lower energy cost than copper or mobile. We are talking orders of magnitude reduction, a really significant advantage. By placing more micro and pico-cells at the end of each fibre we get mobile and WiFi infill for free (or very near). No need for more masts and towers! And instead of our vehicles, appliances, health monitors and other goods connecting direct to the internet they can simply communicate to each other directly over very low cost short hops until they reach a fibre connection - if needed. Fibre truly will "overbuild" mobile with 5G and WiFi for the last few metres.

Fibre is therefore essential to meet the ever increasing demands of all homes and businesses today and into the future. And, it supports the evolution of mobile networks for people to stay connected when they are out and about.

## **WE HAVE A CHOICE**

The choices before us are simple; do we want to be in the future game or no, and do we want to empower the few or the many, a part of the population or the whole, are we to be inclusive or an exclusive society? New Zealand has the right strategy, the right plan and is well progressed toward completion.

There is no sign that New Zealand is giving up on fibre with the next phases of UFB and RBI announced. Everyone will be getting super-fast fixed broadband and mobile coverage along the way – all enabled by building fibre deeper and wider. Truly visionary!

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