

Commentary: Is the UK on track to achieve 2015 target?

Summary: Consumers in the UK enjoy, or suffer from, a variety of broadband speeds, limited for most by the length of their connection to fibre. In Scotland, for example, more than 50% of premises are more than 1km from the nearest exchange. Unless fibre is brought much closer to these communities it will not be possible to deliver the government's 2015 target of 24Mb/s to 90% of the population. To cater for our 2020 targets (> 30Mb/s for 100%) fibre will have to come within 300m of most of the population. (Wireless solutions will be used in some areas, but long-distance wireless is only effective where population is quite sparse.)

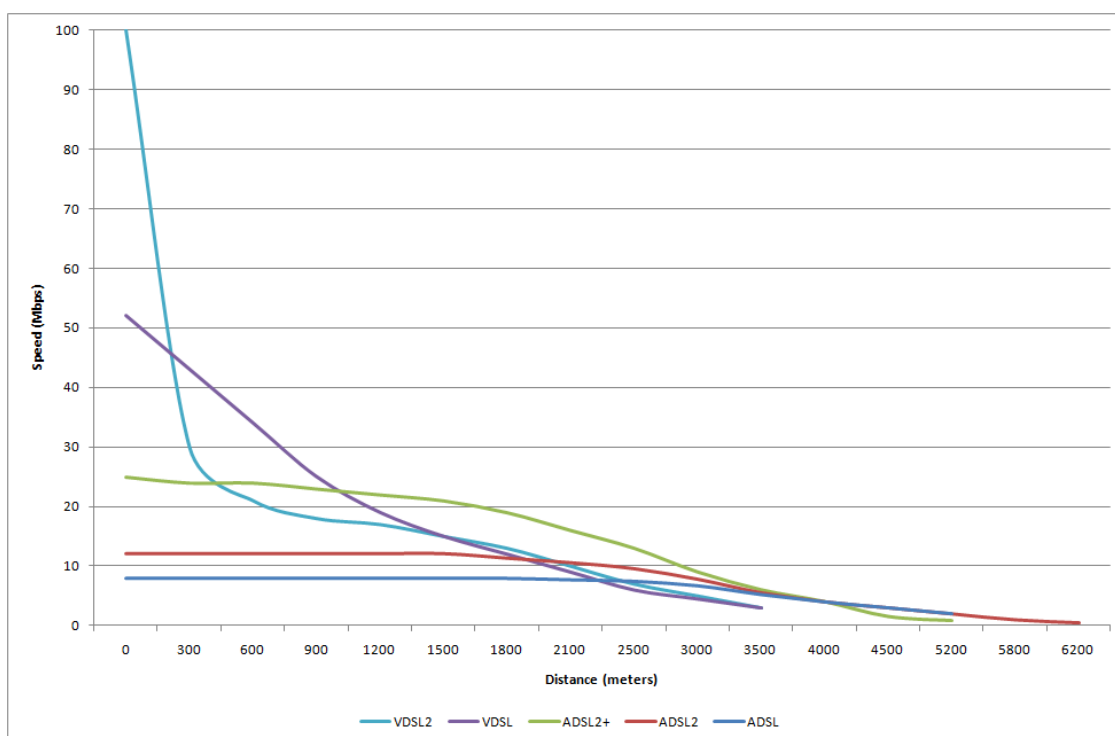
Current data suggests that this investment in fibre is not yet being made.

How can we deliver superfast broadband? We use four different physical media to carry broadband. In order of decreasing capacity, these are: optical fibre, wireless, coax cable, and POTS (plain old telephone service) twisted pair.

There are, fundamentally, only two ways to increase broadband speed. The first is to deploy new infrastructure (eg fibre in place of copper or coax in place of POTS), the second is to make more efficient use of existing infrastructure.

The second choice is subject to the law of diminishing returns. In the UK the active equipment driving the legacy copper POTS infrastructure has been repeatedly upgraded over the past decade, to achieve increasing maximum speeds.

However, fundamental limits (bandwidth * distance² limits) that mean that, for a given cable, higher bandwidths can only be delivered over shorter distances. We see this in the graph below showing the performance of various generations of DSL technology:



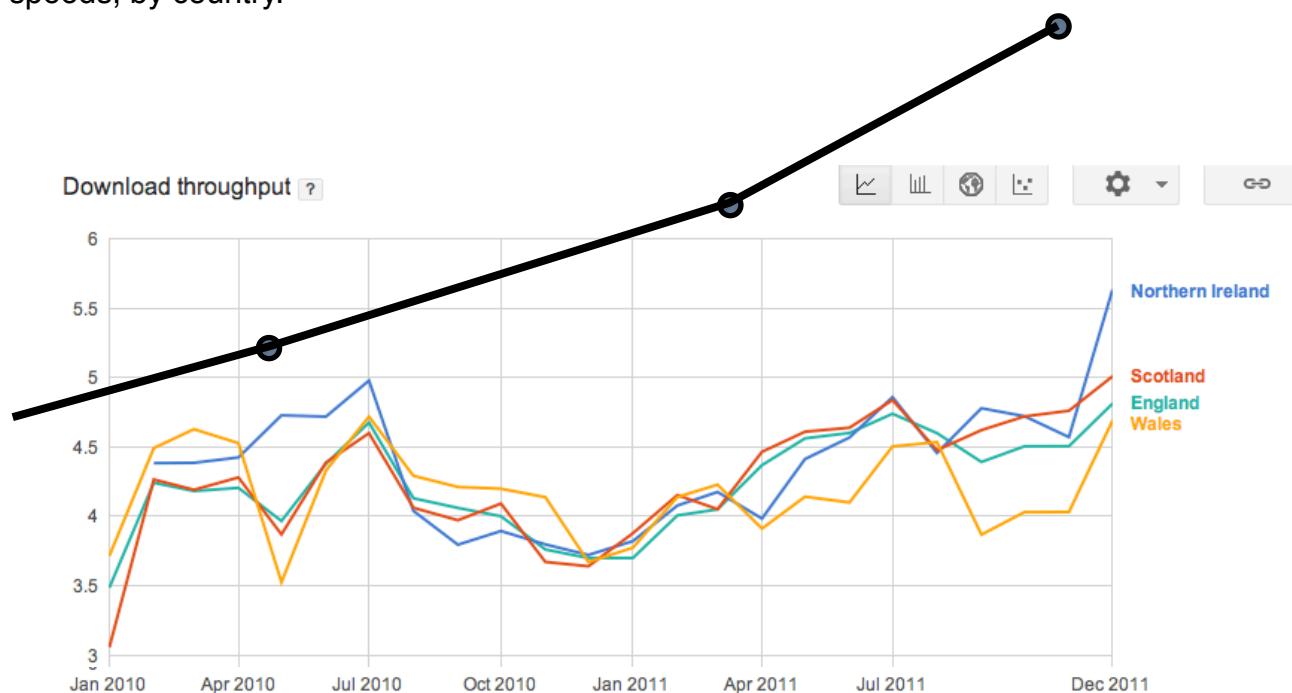
<http://boundlesscomms.com/fibre-wireless-confirmed-rural-broadband-solution-for-lancashire.html>

This means that the benefits of future improvements in copper-based technologies will only be enjoyed by those close enough to fibre. Only those with fibre within less than 1km can benefit significantly from VDSL; the limit is less than 300m for VDSL2.

What progress so far? The average broadband speeds reported by Ofcom are increasing: 4.1Mbit/s in April 2009, 5.2Mbit/s in May 2010, 6.2Mbit/s in March 2011, 7.6Mbit/s in Nov 2011. Does this suggest we will meet the 2015 goal?

If these increases were a result of fibre or wireless investment, we should expect those suffering from long copper connections to benefit most: minimum, median, and average speeds would rise. However, if they result from the introduction of better DSL technologies then the benefits will be felt by those closest to the fibre – who already enjoy the highest speeds – average speeds would rise, but the minimum and median speeds would not.

If we plot median broadband speeds in the UK, we find that, from February 2010 to November 2011, these remained largely unchanged. This suggests that the increase in average speeds over this period results from incremental improvements to DSL. The black line shows the average UK speeds reported by Ofcom; coloured lines show median speeds, by country.



This plot was generated with google public data tools <http://www.google.com/publicdata/explore> using SamKnows data accessed via [Measurement Lab](http://www.measurementlab.net/). SamKnows also provides the Ofcom data.

Conclusion: The data to November 2011 indicate that most of the increase in the UK's average broadband speed over the past two years results from more efficient use of existing copper infrastructure.

This helps those who are already closest to fibre, but the rest of us can only benefit from improvements in DSL technologies if substantial new investment is made to bring fibre within reach.

It would be helpful if Ofcom were to publish minimum and median figures in addition to the mean statistic already included in their periodic broadband speeds reports.

Michael Fourman
March 2012