APPENDIX 3: Alternative Technologies

Satellite Broadband

Satellite technology can deliver 6Mbps at a cost of around £20/month to the individual with no cost to the council over the same time period to the BDUK opportunity. However at the moment on this tariff, while download speeds can reach up to 6Mb, upload rates are typically 1Mb and monthly data allowances are 4Gb. Ofcom research indicates that average monthly downloads in the UK are 17Gb and the technology simply cannot deliver symmetrical services on download/upload speeds, which preclude business uses and two way video. Business users in particular need uploading capacity as much if not more than download. Installation of satellite broadband including a wireless home router costs approximately £350 to the individual, though some companies including Avonline are considering including the cost of the satellite (£200) in the package, so installation costs are reduced to £100 with £50 for a wireless home router.

This package would not currently be able to deliver the equivalent service available by cable in Bath or other urban areas in the District. An improved quality package is available via satellite providing 10Mb download, 4Mb upload and 25Gb monthly data allowance, however this costs in the region of £85/month to the individual and still cannot deliver a symmetrical download / upload service.

EXAMPLE BROADBAND SPEEDS AND COSTS BY LOCATION						
Location / Type	Maximum download speed	Maximum upload speed	Monthly Usage Limit	Installation Cost	Cost per month	Cost in the first year
Urban / Cable	24Mb	24Mb	40Gb	-	£3.25	£39
Rural / Satellite	6Mb	1Mb	4Gb	£350	£20	£590
Rural / Satellite	8Mb	2Mb	8Gb	£350	£35	£770
Rural / Satellite	10Mb	2Mb	13Gb	£350	£45	£890
Rural / Satellite	10Mb	4Mb	25Gb	£350	£85	£1370

The main satellite broadband provider in the South West Avonline (using Tooway technology) states that future improvements in speeds and reductions in cost are likely to be slow and incremental for a number of reasons. The latest KA technology satellites that went up over Europe in June have an operating lifetime of 15 years and the £0.5b investment that launched each of the satellites is to be re-couped over the 15 years based on their limited commodity of bandwith and capacity. The price-plans currently available are therefore priced on this 15 year investment plan. Furthermore, Avonline report that all satellite investment is now in this KA technology, which just recently brought the pricing down from £500/600 month to the current plans available, and while future developments will of course take place this is currently cutting edge and no future step changes are envisaged for 5-10 years. In short, while things will improve with the engineering and the hardware, 'tweaked improvements' only are envisaged.

Avonline further stated that businesses, particularly creative / digital and tech businesses need to be on fibre and would not survive in rural areas on satellite technology. Avonline is however keen to promote the benefits of satellite technology and to show what it can deliver. They have a

mobile exhibition that can travel to rural areas to do demonstrations for rural communities and can discuss or clarify any of these points in more detail.

White Spaces

BT are involved in a study in Argyll and Bute to research whether so called "white spaces" in the ultra high frequency (UHF) television spectrum can be used to deliver broadband internet in difficult to reach areas. Initial results are said to be promising with maximum download rates of 6Mbps, but maximum uploads are 1Mbps.

The technology is also restricted by 'contention' and 'latency' – for example, one person gaming or streaming content can take up 15Mbps, leaving no bandwidth left for other users. The technology is considered suitable for extremely remote households and a maximum of 40 households in one area. Scaled solutions cannot be practically applied, not even to the extent of covering a large village.

4G Technology

Trials are looking at 4G (4th Generation) mobile technology to provide a broadband alternative for people who struggle to get a decent service down a fixed line. 4G (or LTE – Long Term Evolution) uses the 800 Mhz spectrum on the radio network, which is to be auctioned in 2012 by Ofcom, and which could be deployed as early as 2013. The technology works but there is a trade off between flat terrain and high antenna equivalent to high TV masts which have a reach of 12km. The idea is to use existing masts which could be leased from owners ARQUIVA or to use mobile operators own masts.

Services are expected to be comparable to existing 3G mobile in terms of cost and accessibility. So if someone is able to use their mobile to access the web in a rural area, they would be able to use 4G at a cost of around £15 / month. Theoretically, 4G / LTE can support up to 70 Mgps. 20 Mgps is more realistic as capacity is shared between users in any one antenna area and this decreases the further you are from the antenna. Trials have shown however that actual performance in real experience trials are more like 4-8 Mgps and uploads are maximum 1Mgps.

BT suggest that 4G is suitable for small, remote communities, certainly of less than 1,000. The technology is not appropriate for scaled use due to 'contention' and 'latency'. Contention is where capacity is shared between users, so the masts used in Cornwall are delivering 40 Mbps maximum but shared between 40 customers or more and to increase this you simply need more masts. Latency is a delay in upload / download speeds.

There are options for an individual to upgrade by installing a bigger antenna on their own premises and their own 3G router. The SIM card from a 3G dongle could be put in to the router, but costs and performance improvements are not yet confirmed.

Community Solutions

Both BT and Avonline report that wireless community solutions can be great in concept but difficult to work with in practice. Issues include ownership, billing and technical support, though these can be overcome with proper resource and support. There are successful examples including in the Forest of Dean, but also examples of where wireless networks have been installed with a limited capacity, which has then precluded improvements under BDUK funding due to state aid, eg. in Suffolk the community installed a wireless network 2 years ago to deliver 2Mbps. BDUK is now circling round them due to state aid restrictions. There is therefore a risk that undertaking projects

that do not maximise possible capacity at this stage, due to technical limitations, will then be precluded from further improvements using public funding.

Community solutions are also applicable to fibre and may be more appropriate in order to invest in solutions which are future proofed and which deliver appropriate capacity. An interesting project in Cumbria has struck a deal with BT, whereby the community is digging and laying 40km of trenches and ducting to spec and BT is putting the fibre in. The community had to demonstrate committed demand in order to secure the deal from BT.

BT are happy to meet with communities that can represent their demand eg. Claverton and Wellow. However, they would prefer this to be facilitated and undertaken in a systematic way rather than on a community by community basis. B&NES is seen to be more about infill in most cases, however the most rural areas eg. around Chew Magna are 'category 1' where intervention would be needed to bring in broadband.

Communities in areas that are close to enabled cabinets could come together to subsidise the gap. For example, in Kent, the Parish Council is subsidising BT by £50,000 to bring broadband in to their community.