BROADBAND (FTTC) AND TELEPHONY (PSTN) IN

BARTON ST DAVID (BSD) – A 2019 APPRAISAL

SYNOPSIS. This appraisal highlights the current situation and impending problems with both Broadband and Telephony in BSD and recommends remedial and preventative measures that should be taken now to both meet developing demand and avoid the need for hasty, unplanned and expensive actions to be taken in the future to restore critical services.

INTRODUCTION

All residences in BSD are connected to the Baltonsborough exchange through Cabinet 3 which is located roughly in the middle of the village. The cabinet straight line distance from the exchange is 3km and some residences are over 1km from the cabinet, clearly cable distances are longer. The telephone numbers are in the range of 01458 850xxx to 851xxx. BT is the sole provider of telephone lines (PSTN) and Fibre To The Cabinet (FTTC) into the village. Mobile phone coverage in BSD is extremely poor on all networks with significant shadow areas and no-signal blind spots. In the pre-broadband era BSD was always on the trailing edge of technology being way behind its urban neighbours on the standard of PSTN and dial-up internet. After a concerted campaign, FTTC was put into the village in spring 2015 and after some initial teething problems, mainly centred on board capacity in the FTTC cabinet, broadband above the previously unreliable 0.2 to 0.5Mbps became available to all BSD residents connected to PSTN Cabinet 3.

Although High-speed broadband is available at the cabinet, speeds available at residences, other than those in the immediate vicinity of the cabinet, are significantly (an order of magnitude) lower. This is as a result of the use of ageing copper and aluminium wiring that connects these properties to Cabinet 3. In spite of considerable efforts by Openreach engineers many residences are still only able to get speeds in the low Mbps

CURRENT BROADBAND SITUATION

Lately there has been a general feeling that broadband speeds in the village are steadily deteriorating, this was substantiated by a mini-survey of a number of subscribers in the village. Spurred by this indication of widespread performance issues, some possible causes have been investigated.

1) **A fault (noisy line) on the PSTN connection between Cabinet 3 and the Baltonsborough exchange**.

   a) This effect on broadband speed was recently highlighted: An Openreach engineer spent over 2 hours rectifying the slow speed on a line and drew attention to a problem which had not previously been considered (See Fig. 1).The cause was traced to a fault on the PSTN line from Cabinet 3 to the Baltonsborough exchange. Being technical for a moment, there was a low resistance to earth on the PSTN line between BSD and Baltonsborough. This also means a low resistance to earth on the line from the residence to Cabinet 3 which in turn reduces the signal to noise (S/N) ratio on the line – or, in layman's terms, reduces the maximum broadband speed at which the line can operate successfully. The engineer tried two other 'spare' PSTN lines between the cabinet and Baltonsborough before he found one that met the resistance to earth criteria.

2) **Line degradation**.

   a) The BT quiet line test (17070 Option 2) has over the years generally indicated an increase in background noise on the lines to Baltonsborough. This takes the form of static, hum and crackle and this consequential reduction in S/N ratio will have a detrimental effect on the achievable line speed and its stability. It should be stressed here that the quiet line test is very subjective and can only provide a qualitative indication of this undeniable trend.

3) **A capacity problem on the Broadband provision to the village.**

a) When FTTC first came to BSD, BT underestimated the take-up of broadband and only installed one card in the cabinet. The fact that all BSD subscribers were desperate for any form of usable broadband seemed to have escaped the planners with the result that the channels on the single board fitted were used up within a fortnight. This produced a delay in roll out to many customers whilst additional board(s) were obtained and installed.

b) The actual usage demands of users have changed over the intervening years and markedly so for evening/weekend traffic. They are being compelled to use fast broadband by the ubiquitous reliance on digital services (as advocated by government policy). Households, students and businesses all rely on high speed streaming for such things as data gathering, TV video, gaming and file sharing. This has rendered the use of outdated contention ratios obsolete as more and more subscribers aspire to the high speed, uncapped downloading that is offered. It is vital that the capacity is provided to meet this rapidly increasing demand.

CURRENT PSTN SITUATION

1) In living memory, one of the ways to cure telephone and dial-up broadband speed problems was (and is) to move the subscriber to a different line between Cabinet 3 and the Baltonsborough exchange. In the early days, with spare lines available, this could well have been a practical solution but is no longer viable. This method has been used, or claimed to have been used, over so many years that the use of spare untouched lines is no longer a credible option. The inevitable conclusion is the problem is eventually shifted to some other unsuspecting or more tolerant subscriber. It could also just be possibly be that undoing and recoupling end terminations might clear some surface corrosion and temporarily improve connectivity.

2) With the arrival of better broadband, subscribers are less dependent on PSTN and have transferred to or supplemented their voice communication with other alternatives such as VOIP or Skype. This has inevitably resulted in a reduction in use of the BT PSTN lines but it is not a fully inclusive substitute. There are some who will not, or cannot, use anything other than a basic telephone. There are also two other significant PSTN users who have no option.

a. Auto dialler Security Alarms that rely on a telephone line to connect to a third party to initiate remedial action.
b. Personal Safety Alarms for the elderly and vulnerable that rely on a telephone line to summon help and assistance. These are becoming more and prevalent in BSD as the average age of its population increases. (Note: Some personal alarms can be linked to a mobile phone but this is not a satisfactory alternative in this poor mobile reception area)

CONCLUSIONS

1. The PSTN lines between Cabinet 3 and the Baltonsborough exchange, which are partially aluminium and date from the early 1960s, had a projected dependable life of 30 years or less. They are now nearly twice this maximum life.

2. Although lines have been swapped around, the number of changes must indicate that any spare lines were used up years ago and any remaining serviceable lines in use have had several reconnections. As a result of increasing number of failures and the subsequent remedial solution of swapping lines around, the option to use spare lines to achieve improved performance is no longer viable.

3. Bad earthing on the PSTN line between Cabinet 3 and the Baltonsborough exchange adversely affects the Signal to Noise ratio on the non-fibre line between Cabinet 3 and the subscriber and hence reduces broadband speed, sometimes quite significantly.

4. Some subscribers to broadband via cabinet 3 will always have considerably reduced speed due to their distance from Cabinet 3 over metal wires be they copper or aluminium.

5. Aluminium cables are now well beyond usable life, they are very prone to faults, significantly reduce performance and are getting progressively worse. Copper, too, is unreliable and has limited capacity the further the residence is from the cabinet. Replacement of all aluminium and longer copper cable runs with over ground fibre (ADSS) would solve this problem, increasing reliability and reducing operating costs.

6. Auto dialler security and personal safety alarms, particularly the latter, depend on a 100% reliable PSTN (or dial up) connection. The unreliable performance of the current provision is significantly prejudicing the safety and security of BSD residents.

7. Due to poor signal coverage in BSD, mobile phones are not a reliable alternative to PSTN.

RECOMMENDATIONS

1. All the PSTN lines between Cabinet 3 and the Baltonsborough exchange be renewed.

OR

2. As well as broadband, the FTTC be utilised in lieu of the existing PSTN lines for dial-up telephony
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AND

3. In concurrence with 1 or 2 above, the existing metal cables between subscribers and Cabinet 3 be replaced by over ground fibre (ADSS) so that the full benefits of the significant investment in FTTC are not squandered.

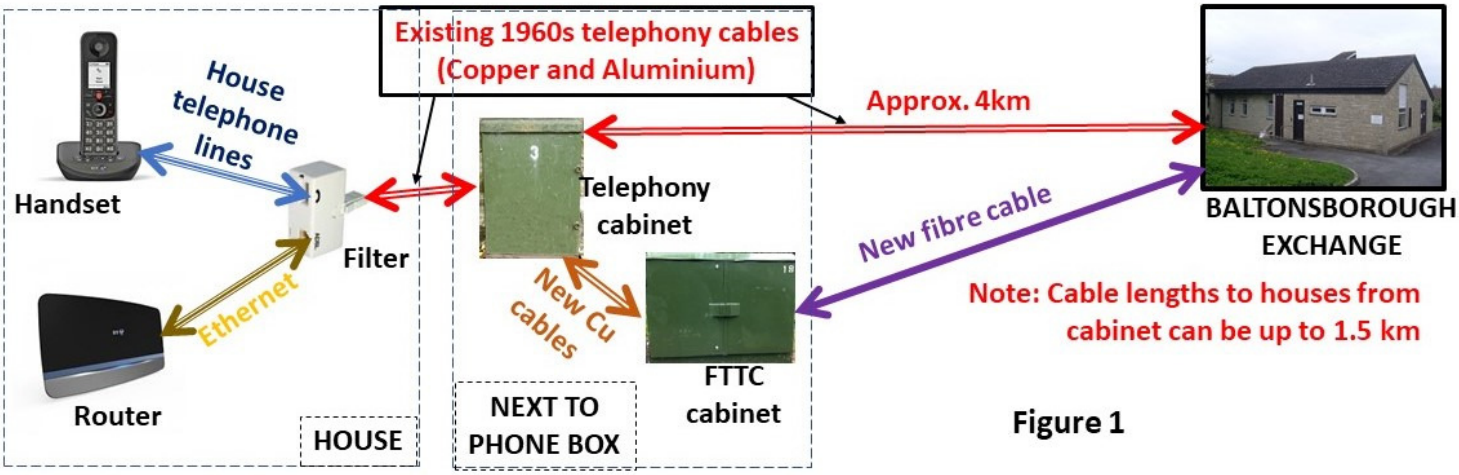

Figure 1