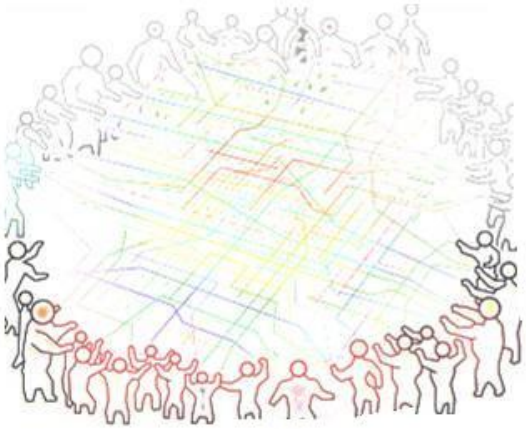
The following response is informed by 22 years in BT, including time reviewing the original definition of the Metal Path Facility, over two years with BDUK which included writing the technical requirements for what was a rural broadband programme and time since working with companies, communities and county councils on projects to deliver world class connectivity.



In The Bit Commons response to the DCMS consultation, the following points were made;

1) Defining a USO highly problematic given the terminology of 'speed' and 'broadband' are not helpful in defining an appropriate level of access to what is a wholesaler data transport service. The USO will not be to describe an end user experience like browsing or streaming but describe how applications should work if the components not under its control work as expected. These include home owners network and equipment attached to it, how and where information is stored on the internet and how over the top services are configured to work and the resources needed to configure them.
2) 'Speed', 'even access' speed should not form the legal basis to define a connection to what would be a data transport service. 10Mbps is no more than a sentiment relating to our current experience and expectation of how the copper access network behaves. The mode of expression is tied to the current distance limitations caused by the attenuation characteristics of the copper medium. It also assumes G.Fast might be relevant to rural areas where this is unlikely to be case. Signal attenuation (distance), low customer densities and power costs all dictate against BT deploying active equipment deep in the access network. For legislative purposes, the terminology around 'speed' needs to be dropped and replaced with the term 'throughput'.
3) The BDUK activity if supported with the appropriate levels of transparency and continued scrutiny still has as much as £1bn plus BT's capital contribution to delivering fibre bundles deep into rural areas and extending the existing fibre access fabric using FTTdp.
4) The current fibre upgrades costs are significantly less than that outlined by the BSG/Analysis Mason report of 2009. The latter is material, as £29bn is still quoted by BT as a fundamental to their decision making. This number is at odds with emerging experience and best practice. The number is not even discounted to reflect the comprehensive FTTC costs where the UK Government has provided generously.
5) Before a suitable access product suitable for a USO can be defined, it is likely Ofcom will need to describe and then licence what is a wholesale data transport function which manages the quality of user experience by controlling the resources available (bandwidth per user) and how it is configured to minimise delay, jitter and packet loss. This includes performance up to an internet gateway but not beyond. These functions are separate to the act of provisioning access to the data transport resources.

The Bit Commons response to Ofcom's call for inputs expands on these points.

1.0 How should the minimum technical performance of the USO be specified?

1.1 10MBps 'speed' reflects a sentiment that this 'speed' represents an overall acceptable user experience for a typical household. In that respects it is not different from the sentiment of 2Mbps for the USC which was thought to be sufficient for a single homeworker to work from home. The former suggests the homeworker can now continue homeworking while any family members do what they wish to do online, including video streaming and gaming.

1.2 The 10Mbps like the 2 Mbps before it, is shorthand for something else. The requirement is to support sufficient connectivity (quality and quantity) to do as one needs at a particular moment in time. 10Mbps is the new minimum at the edge of a network born of a certain pragmatism to answer an instinctive but lazy question about 'how fast?'. Never mind the obvious that all connectivity occurs at near the speed of light and thus the issue is about throughput and the underlying usage and access to the shared network at any particular point in time.

1.3 It would easy for the UK to blag its way to 10Mbps while doing very little. Satellite Internet services can deliver a 10Mbps download service. 4G mobile can deliver a 10Mbps service and fixed wireless services can do the same where available. It appears these 10MBps services are not quite 10Mbps enough for some and rural folk are seeking the same services, prices and choice experienced by users in towns and Cities. While DCMS have pointed to the need for technical neutrality this has the consequence of avoiding some of the variations that matter to customers such as peak hour performance, delay, packet loss and resources available during the peak period.

1.4 Sitting down to write the USO for Broadband points to the need to define what you mean by Broadband. This will be a first as 'Broadband' is not a connectivity service, it is not access to the public internet and it is not the resources needed to maintain a suitably stable and working connection to the public internet. Broadband refers to the broad range of high frequencies used to form a connection. The more frequencies you have access to which is a subject of the distance from point of origination of the radio signal, the more data can be carried. This is not 'speed' but throughput and the available throughput is used to carry data at close to the speed of light. The speed is a function of the workings of the electromagnetic spectrum, a gift of nature.

1.5 A pre-condition for the USO for Broadband points to the need to define a service and define how it is accessed.

1.6 The USO for the telephone service combines a description of a service called 'telephony' and an obligation to provide a means of access to that service. The latter is achieved by ordering a 'telephone line' which is technically described as a Metal Path Facility (MPF).

1.7 A service that supports access to the public internet is a data carrying service and thus it would appear, those wishing to be a universal provider of broadband services should register as such and possibly be licensed as such by Ofcom. The 'license' would need to describe all the essential characteristics of the Universal Data Transport service. This would cover the data transport between any UK user and premise and access to the public internet. This would need planning rules for the allocation of peak hour bandwidth, and budgets for packet loss, delay and jitter where the latter are applied. This would include a definition of 'best efforts' and any quality of service methodologies used during peak hour working. Equally it would have to exclude the responsibility for the performance of attached devices and data which has not been stored in a location where inadequate hosting resources are available.

1.8 Once potential Universal Providers have described the nature of their data transport services, the question then moves on the geographic areas of coverage and Ofcom might wish to include a licence condition to reference the service and the coverage area. Does Ofcom impose wholesale access conditions? Does it impose price thresholds, or specify some international benchmarking for the wholesale prices?

1.9 The implications of an operator unable to meet a USO licensing condition, which might include wholesale arrangements would suggest they remain as an in-fill communications provider. This need not be as bad it appears provided the USO suppliers are expected to deliver a much higher level of service and customers are expected to contribute more to make such a service available.

1.10 Satellite providers can describe an access product of 10Mbps or more.

1.11 Fixed Wireless operators can describe the same for the areas they wish to register where service can be supported with an affordable access fee.

1.12 Mobile Operators would describe a describe available using booster boxes.

1.13 How would this work for BT and BT Openreach?

1.14 The licensing of the wholesale data transport element looks to straight forward enough, as the BDUK requirements describe the wholesale data transport service in a manner that can be supported by a national carrier or local carrier. The BDUK technical requirements can act as a template which can be reviewed and updated if necessary, but it is important the note that requirement in stating a minimum can go out of date very quickly. The growth of on-demand TV means peak hour bandwidth allocations are likely to exceed any allowance set out in a generic requirement. Never the less writing a minimum requirement creates a useful set of thresholds to benchmark against and represent an accumulated knowledge to that point, to be updated and corrected as more is learned.

1.15 What sort of product do we write the USO around?

1.16 Currently telephone service is made technically possible through the provision a Metal Path Facility or a copper connection. The definition indirectly supports the current idea of 256kbps service but it is a serendipitous by-product of the historic structure of the telephone network. Lines lengths of some 10kms can support some connectivity, (some of the broadband frequencies available are usable at 6Km or more) but to improve service, you either move closer to the exchange or exchange equipment is put in cabinets and brought closer to the customer. The latter describes to Fibre to the Cabinet programme, where improvements in service are achieved by putting electronics closer to customer which shortens the distance of the metal path and increases the amount of the usable frequencies available. In some cases, the metal path is replaced in its entirety by a fibre path and the constriction on throughput is effectively removed. This is called Fibre to the Premises.

1.17 Is the USO therefore written to reduce the length of the 'metal path' so the required throughput is achieved as a consequence, i.e. all metal paths shall be no more than c1.8km from an appropriately configured xDSL equipment should a customer demand it. This is how BT is describing their approach to the problem of long line lengths. The difficulty with this approach is that you need to keep inserting more electronics deeper in the network if you change the 10Mbps target or if the copper to the premise is not capable of sustaining the required throughput. It is also problematic for those on 5-8Mbps where the marginal cost of electronics is likely to be too great. It is also peculiar in so far as new builds of any size will benefit from direct fibre access connections. There is nothing to suggest that on a per line basis such an approach would work or whether the proposed untested

solution would work at all. This inside out (exchange to premise) approach has worked so far for cabinets but the main variables of cost are power and the overheads BT is applying to plan and project manage the development of its network, so in the case of BT, the time may have come to begin building towards the new fibre assets in the ground, most of which in rural areas have been publicly subsidised.

1.18 This eventuality was included in the BDUK technical requirements and was also referenced in the state aid conditions. The requirement to support communities gaining access to affordable backhaul over subsidised access has been ignored, while the requirement to support an affordable fibre on demand product has not been enforced. BT has chosen to price the latter and treat it as if it were a private circuit, however it is also installing and planning 'native' FTTP and installing FTTdp in a selective way. There are contractual provisions and state aid provisions which if enforced would act as a proxy for a USO access product based on fibre. It is worth Ofcom's time investigating the option of fibre on demand which includes FTTdp as a USO product. The existing cost or liability of £3,400 per provision a new PSTN line is within the bounds of the possible if the will is there to make it happen. If this such was developed alongside other efforts to maximise and recycle BDUK expenditure then much of the USO could be met if not exceeded by 2020. If this is considered alongside the need to accommodate a possible sunset date for telephony, then a USO based on fibre access, particularly in the form of FTTdp is achievable. This is rehearsed in the BDUK technical requirements as is the cost of provision, just note the underspends, and the capital accruals BT is making for BDUK. Furthermore, BT's written evidence to the CMS Select Committee inquiry on Broadband made clear that,

The remaining 1.1m premises to get the overall 5 million current planned total are expected to cost £1bn (or approximately £879 per premises) as we have completed the cheapest premises first. These remaining premises are planned to include a much large percentage of FTTP connections than the current build that will be reflected in the cost.

1.19 While it is necessary to mistrust BT statements on costs, the sentiment is that a large percentage of FTTP will provided in what is considered more difficult to reach areas should be noted. However, outside of the Select Committee setting BT relies more on its G.Fast strategy, which is yet to be proved to be viable for hard to reach areas. This is likely to be driven by decisions about resource allocation. More recent pronouncements Clive Selley, that new builds, business parks and town centres will benefit from FTTP should also be noted.

1.20 Due to resource issues it would be important to work through the changes Ofcom is planning for the provision of dark fibre, and a revised duct and pole access product. These are likely to be important contribution to third parties assisting in the provisioning of a USO product based on fibre access.

1.21 In summary for BT the default position would be some additional subsidy to subsidise taking electronics deeper into the network. The alternative would be to take the existing BDUK requirements for Fibre on Demand with the state aid requirements and push for this to be enforced and implemented using the £1bn of public funding left after funding phase 1 and phase 2 cabinets of 25,000 cabinets.

1.22 For other suppliers, the first step is for them to declare their willingness to be USO suppliers as opposed to being selective in-fill suppliers. Ofcom would need to define the key responsibilities in licensing the data transport assets of a potential USO provider, including any minimum geographical definition for the term Universal. Those suppliers willing to be licenced would then need to propose

their access solutions which would meet the USO access requirement. This is likely to be shaped by what BT is expected to implement.

2.0 Demand for the USO

2.1 There is proven demand in rural areas for improved connectivity. The worse the current service the greater the demand.

2.2 Ofcom have used a proportion 2.4m premises (over 8%) who cannot get a 10Mbps service. This suggests a total of 30m premises, where Openreach report a system size of 26m and their VDSL solution reaching 86% of these or 90% depending whether it is BT or the Government with the promise of reaching 95% by 2017.

2.2 It is proving reasonable to assume that at least 15% passed are not seeing the 24Mbps service, - 8% not seeing 10Mbps is reasonable, so 2.4m may not be unreasonable if the significant gaps on town and cities are considered. Against this we need to consider the CEO of Openreach commitment to change BT's approach;

''Our approach has delivered affordable superfast services to the vast majority of the country in the fastest possible time. We want to build upon that by making ultrafast broadband available to most of the UK. We will do this using a mix of G.fast technology and Fibre-to-the-Premises (FTTP), with the latter focused mainly on new developments and small businesses in high streets and business parks."

2.2.1 It is does not appear unreasonable to use 2.4m and falling as a benchmark where demand is at least 30% if the propositions are affordable.

2.3 Ofcom may find pent up demand from the SME sector where improvements to broadband have been withheld so private circuits could be sold as a substitute for fixing broadband. Demand here is likely to be high but curtailed by the need for existing contracts to run their term.

3.0 Cost, proportionality and efficiency of the USO

3.1 Affordability has been defined by BDUK and this could be used at the beginning of the process and adjusted if needed.

3.2 To assess the likely cost BT will need to map, as per the state aid measure all public funded assets. It is essential handover points, aggregation nodes, Tij/Splitter locations are mapped so the spare fibre bundles can be seen and cost of extensions more easily understood.

3.2 The cost per customer could be bounded by the current PST limit of £3,400. However this may need to start at lower point or in a way that permits groups of customers to order a service together, so the cost of provision for a FTT dp can be divided between multiple benefitting customers.

3.2.1 A significant amount of FTTdp can be funded from existing BDUK underspends, BT capital and the return of clawback and proxy costs. With no active costs (power/electronics) and customers paying a connection charge, it is possible to introduce such a product and manage demand levels. It is important the available funding is subject to a reconciliation process so the full amount available can be appreciated by all.

3.3 One significant factor is a possible shortage of BT resource. The BDUK constituted in more than 200 new live cabinets a week passing some 40,000 new customers a week. It likely a discrete FTTdp

manifold will support 3-8 customers in rural areas so the resource implications do need consideration.

3.4 Ofcom will need to consider whether their plans for dark fibre access and a revised duct and pole product will aid those willing to offer a USO service in parts of the UK.

3.5 The triggering or acceptance of a USO based order needs consideration. If other providers can offer equivalent services, then an obligation on BT to spend £3,400 in such places needs to be re-considered. It suggests perhaps a smaller number is used in the early years of operation.

3.6 There are now many examples of entities in rural areas laying their own communication duct. There is no particular reason why customers cannot plan to bury their own communications duct on private land thus removing the ECC's. BT Duct and chambers can be ordered online and installed consistent with BT's practices. Some guidance is needed but the civils are not a complex task.

4.0 The universal service provider or providers;

4.1 Clearly BT as the owner of Openreach, BT will feature.

4.2 I think it is up to other operators to respond to the emerging shape of the requirment and offer to become USO providers and outline the conditions for them under which that might work.

4.3 The convergence of services needs consideration. BT could for instance bring a fibre bundle to a pole and support a 4G Microcell from a pole using its newly acquired EE spectrum. It may be possible to specify the USO but provide customers a choice on how it is fulfilled. In this case BT would be using in rural areas a publicly funded asset.

5.0 Funding of the USO and potential market distortions

5.1 The Bit Commons is suggesting that using the BDUK technical requirements, the large underspends in every county, and BT capital accruals for BDUK provide a framework and product definitions for which Ofcom can build and develop.

5.2 Furthermore, the state aid requirements outlined in SA33671, particularly those on affordability, the mapping of publicly funded assets and transparency of costs provide a strong set of candidates for secondary legislation.

5.3 The existing telephony arrangements for funding could be taken as a starting point with supporting arrangements to minimum orders supporting for instance an FTTdp installation. This approach should not be divorced from BT's request for a sunset date for the telephony service. The provision of future proof connectivity provides an opportunity for BT to declare a sunset in areas where they can take orders for direct fibre access.

Thank you again for the opportunity to make a contribution. I am happy to provide more detail if you need it.

End.

Mike Kiely, Founder, The Bit Commons