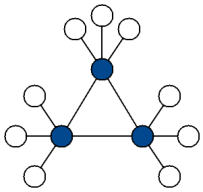

High-Speed Universal Broadband Services

Response to Ofcom consultation on: Designing the broadband universal service obligation

1. This is a response to the Ofcom Consultation on `Designing the broadband universal service obligation' submitted on behalf of High-Speed Universal Broadband Services (HUBS). HUBS is a Community Interest Company providing upstream connectivity to community broadband networks operating in Scotland. It was established by the Universities of Edinburgh and Stirling as an outgrowth of a successful research project (the Tegola Project) to develop the tools required for establishing operating community broadband networks in remote rural areas. The HUBS network covers large areas of rural Scotland and is expanding rapidly. Its members and affiliated networks have as much experience of providing broadband services in remote rural areas as any other operator in the UK other than BT. Individually, the authors of this response have been responsible for the establishment and development of a number of community broadband networks in the West Highlands and the Scottish Borders.

2. The networks associated with HUBS are mostly operated as non-profit ventures with their capital costs funded from grants, donations and voluntary efforts. Their charges are set to cover operating and maintenance costs. In some cases the networks generate a surplus which is ploughed back into development of the network. HUBS is keen to promote the development of small local businesses which can undertake the work of installing, operating and maintaining rural broadband services, perhaps alongside other IT and technology-based services. The goal is to underpin economic activity in rural areas, which relies upon access to adequate broadband services.

3. While HUBS and its members are not committed to fixed wireless broadband as the solution to rural provision, all of our networks rely heavily upon this technology as the most cost-effective option under current circumstances. In the longer term, several HUBS members hope to install fibre networks in some of the areas that they cover, but population densities and topography mean that this is an expensive and difficult option for the most rural communities.

4. In this submission we draw upon our practical experience in serving the kind of communities to which the Universal Service Obligation (USO) would apply to comment on the issues that arise in defining and implementing a USO. While there are many points that could be made, we wish to highlight a small number of issues.

5. **Defining the USO**. Put at its simplest, satellite broadband is not a satisfactory option. Many of our customers and community networks have been through a stage of considering or, more often, using satellite broadband. No independent party or satellite customer believes that this is a viable solution to the goal of providing adequate broadband services in rural areas. We are

not alone in reaching this conclusion. The rules proposed by the FCC for the Connect America Fund (the renamed version of the Universal Service Fund) define a set of tiers for universal service provision.[1] These tiers include provisions concerning latency and traffic allowances which would exclude any current or plausible future satellite service in the UK. The requirements for the lowest tier correspond to what the UK Government might wish to define as the USO. They include a latency of less than 100 ms and a traffic allowance of at least 150 GB per month as well as a download speed of 10 Mbps. (The high latency tier would rule out existing satellite services because of the additional requirements relating to voice performance.) Further, the speed requirements are measured by reference to the average speeds actually provided, not some "up to" figure that applies when no-one is using the network.

6. Any mechanism for implementing the USO must be technology neutral. The original provisions for the BDUK program to promote access to superfast broadband did not meet this requirement since, in effect, they ruled out long term reliance on wireless provision. Unfortunately, meeting this objective is far from easy because of the different characteristics of the technologies available. The key issue is whether the USO is implemented on an individual or area-wide basis, which reflects the way in which fixed network costs are allocated.

7. Assuming that Ofcom and the UK Government do not wish to entrench the incumbent telecom network operator, any USO must involve appointing and funding a Universal Service Provider (USP) on an area by area basis. In effect, this is how the Connect America Fund operates. The question is what obligations the USP is required to accept. The choice between technologies will then depend on the relationship between fixed and marginal costs for different methods of providing broadband and how the USP is allowed to recover its costs.

8. For fixed wireless broadband, the fixed cost of constructing a set of masts capable of covering all of a rural area is high relative to the marginal cost of connecting one property. On the other hand, the relationship between fixed costs and marginal costs is quite different for fixed wire providers, whether over copper or fibre. If the USP is given the right to cap the cost for an individual connection, this will skew the competition in favour of fixed wire technologies but at the expense of the most remote properties with the highest marginal cost of providing wired broadband services.

9. Since there is a choice of broadband technologies which can provide the minimum level of service sought, we believe that any USP must be required to provide the specified level of service to any customer who requests it within the area for which they have been appointed as a USP on a standard set of terms. This would not preclude the possibility of appointing multiple USPs for an area, but it would prevent any USP operating a discriminatory connection or pricing regime designed to exclude the most remote customers.

10. **Competition**. Ofcom has a general duty to promote competition and many of its regulatory decisions can be appealed to the Competition Appeals Tribunal. However, competition in the provision of broadband services takes different forms and Government interventions over the last 5 years have skewed the competitive framework in favour some technologies and operators at the expense of others.

[1] FCC – Report and Order and Further Notice of Proposed Rulemaking, FCC Docket 16-64, 26th May 2016.

11. The key distinction is well known. It is a variant of the old debate about competition for the market versus competition in the market. In the telecoms sector it is the difference between competition via the provision of infrastructure (the US approach) and via access to infrastructure and network unbundling (the EU approach). Inevitably, actual outcomes tend to involve a mixture of the two approaches, but the UK falls heavily into the category of competition involving network access and unbundling. This history has large consequences, since meeting the goal of universal service at reasonable cost can only be achieved by mixture of networks and technologies.

12. At its simplest a choice has to be made. One option is to invest yet more resources in the monopoly fibre/copper fixed wire network to extend service beyond existing exchanges and upgraded FTTC cabinets by installing fibre to remote nodes and relying upon either FTTP over fibre or FTRN over copper for the final few hundred metres. The marginal cost of this approach rises very steeply as levels of coverage increase from 95% to 98% and beyond. The marginal cost of providing a universal service for the final 1% is very high – easily running into an average of thousands of pounds per connection – and is probably in the tens of thousands of pounds for the final 0.5%. This is far beyond the apparent ability or willingness of the UK Government to fund the expenditure required. So this is not really a commitment to universal service but a program to extend service as far as possible within a fixed budget.

13. The second option is to rely upon fixed wireless services for the more remote communities, as they are much cheaper and more flexible. But, and it is a large but, the viability of fixed wireless services has been severely undermined by the subsidies provided to fixed wire networks. To understand what is happening it is helpful to think of a large plain with villages and thinly populated areas in between the villages. This could be served by a network of wireless masts located roughly 10 km apart. However, fixed wire services spreading out from cabinets in each village mean that there is a series of holes with a diameter of roughly 3 km in market demand for wireless services. By supporting the infrastructure which serves the main population centres – towns or villages – the BDUK programme has had a strong adverse impact on the viability of networks that could operate in the more thinly populated areas and increases the unit operating costs of providing services in those areas.

14. Further, the emphasis on access-based competition has created the expectation that broadband services should be available to everyone at the level of prices that is advertised for more densely settled areas. That is simply not compatible with the costs that any broadband provider incurs to operate in thinly populated areas. Hence, the large fixed wire operators have no incentive to expand in remote areas while smaller wireless operators cannot attract sufficient customers to cover their operating and capital costs.

15. The root of the problem is that there are large economies of scale in operating broadband networks – e.g. backhaul, network management and customer service. For backhaul, in particular, the economies of scale depend upon the level of locally aggregated demand. This drives the economics of providing wireless services. On the experience of HUBS members a USP would have to budget for a minimum backhaul capacity of 1 Mbps per basic connection with provision for redundant circuits to ensure resilience. It is not economic to contract for backhaul on less than a 1 Gbps bearer. A reasonable minimum scale would be to contract for 2 backhaul

circuits of 500 Mbps capacity to serve 500 customers. The fixed cost, assuming 3 year contracts, would be at least £4,000 per month (including VAT) or £8 per month per customer if you are able to aggregate that number of customers. Since the advertised prices of broadband are less than £10 incl VAT per month that leaves little to cover equipment, network operation, customer services, overheads, etc. Quite simply, an operation of this size is not viable even if all of the capital costs were funded by grants or public support, no matter whether it is independent or part of a larger provider. Operators with only 200-300 customers – more typical of community networks in Scotland due to the very low population densities – are even worse off.

16. There is nothing new about this dilemma. It has been clear since HUBS was formed, more than 3 years ago. The public bodies responsible for broadband support - DCMS and BDUK together with national programs in Northern Ireland, Scotland and Wales – have spent the whole of this period ducking the problem. There are good reasons why support for fixed wire networks is the least expensive way of expanding access to faster broadband services. HUBS does not wish to argue that the BDUK money has been wasted or that the policy route followed was the wrong one.

17. The question now is different. It is whether a commitment to provide a universal service of 10 Mbps – or whatever – means anything at all. If money continues to be directed to fixed wire networks and access-based competition, then the clear answer is NO. This path will never achieve universal service in the more rural areas of Scotland or elsewhere in the UK and there is no point in pretending otherwise.

18. What this means is that any process of choosing USPs must take the form of competition for the market rather than competition in the market. There can be only one USP for any area and that USP must have the obligation to serve everyone on non-discriminatory and regulated terms. Those terms must be part of the USP contract and there should be clear penalties for failing to meet USP targets. While there are many details of the contracts that would have to be elaborated, the basic structure should consist of a two part payment structure – one part for sub-area coverage and the other part providing an incentive to expand the number of connections.

19. It follows immediately that financing a USO must require funding either from taxes or a levy on all broadband or telecoms users. This is the standard model in countries where universal service obligations are managed in a transparent and competitive manner. By extension the costs of a USO must not be met by non-transparent and non-competitive mechanisms via regulatory deals for the pricing of monopoly infrastructure.

20. **Backhaul**. The critical constraint facing HUBS members operating in areas where the USO is likely to be important concerns access to adequate (both in capacity and cost) backhaul. A part of what HUBS does is to contract for and manage backhaul for community networks. In this respect we have to deal indirectly with Openreach over the provision of leased line. We have little or no choice because we rely upon unbundling of exchanges in remote areas together with use of EAD Local Access circuits. Without exception our experience of dealing with Openreach over the last two years has been appalling. Their performance is so dire that it goes beyond

chance and incompetence to lead an outsider to suspect deliberate obstruction of anyone who might offer competing services. Delays of 6 or 9 months or worse are routine.

21. It is not important why Openreach's performance in providing the elements that we need for backhaul is so bad. What does matter is that the BT Group has a huge conflict of interest arising out of the lack of competition for backhaul services. In rural Scotland they make no attempt to manage the conflict or to treat small competitors fairly. Until this is dealt with properly, any alternative operator considering whether to take on the responsibilities involved in becoming a USP will be strongly discouraged by the need to rely to some degree on backhaul provided by an entity that is, at best, incompetent and, at worst, poorly regulated and obstructive.

22. There is a separate issue relating to the potential use of publicly-funded networks as sources of backhaul. The Scottish Government has a program called SWAN designed to establish a network which will connect health centres, schools and other educational establishments, local authority offices, and other facilities in many parts of the country. The network relies upon leased lines and unbundled exchanges connected to central network hubs in the main cities. In some cases, members of HUBS are acting as network service providers to SWAN.

23. The terms of the SWAN contract include provision for community benefit use. As a matter of principle it has been accepted that this would cover community networks, especially those acting as USPs. Since primary schools are often better located than telephone exchanges to serve as hubs for community networks, it is both sensible and feasible to permit USPs to share the leased lines. There are significant advantages for both parties. Sharing the fixed cost of a circuit to a school or health centre can reduce the costs of providing backhaul and increase the resilience of the operator's network without compromising the service provided to the primary user.

24. Calls for "joined-up thinking" are easy to make and much harder to apply. Councils and other public bodies operate within bureaucratic structures that are difficult to surmount. On the other hand, those responsible for managing public services know that the costs of providing those services in remote rural areas cannot be found unless they are organised in ways that make best use of the available resources. In this respect, locally-based USPs are likely to be more flexible and innovative than larger organisations with limited experience and presence in the area. For Ofcom the key conclusion should be that its policies and regulatory arrangements should promote rather than hinder the role of local providers in achieving the USO.

25. Further, it is important to note the conflict of interest if the USP is also the main provider of backhaul and leased lines. The reduction in the cost of meeting the USO is offset by the reduction in revenues to the infrastructure arm of the business. It takes little imagination to conclude that the USP would have little or no incentive to find ways of sharing the costs of such backhaul.

26. **Access to physical infrastructure**. Backhaul is one element of the infrastructure used by broadband operators to provide their services. Ofcom has made proposals on access to ducts, poles and similar telecoms distribution infrastructure. This is not a critical issue for HUBS members. However, the question of access to mobile phone and other telecom masts is more important. Again, the question of publicly-funded infrastructure arises.

27. Ofcom has powers to require that Code Operators share apparatus, including mobile phone masts, in areas where there is no alternative. In addition, the revised version of the Electronic Communications Code to be introduced in the new Digital Economy Bill is expected to confer a large unrequited benefit on mobile phone operators. We would argue that along with that benefit any Code Operator should be required to permit the local USP to install antennas on telecoms masts provided that the reasonable costs associated with the installation are met by the USP. There would be no loss to the operator and/or provider of the infrastructure, since USP activities do not compete with regular commercial services but the measure would accelerate the roll-out of universal service and reduce the cost of meeting the USO.

28. Separately, the public sector funds a network of masts that are used by the emergency services. In remote rural areas these masts will often be the best way of providing wireless coverage along roads and to settlements that lie outside the coverage of mobile phone and fixed line services. Again, there is no competition between the requirements of the emergency services and the provision of basic broadband services. The contractual arrangements for this network are in transition. Still, we believe that the taxpayer should not be paying for the network unless the operators allow use of the infrastructure by the local USP on reimbursement of any reasonable costs involved.

29. The key principle is that a local USP should not be required to pay more than the marginal costs involved in installing and operating antennas and other apparatus required to meet the universal service obligation, where the infrastructure concerned has been funded by the public sector or has been built under licences granted by a public authority.

30. **Conclusion**. There is a general theme which underlies our proposals concerning the USO. The policies and funding which have supported the extension of faster broadband services over the last 5-10 years have strengthened the fixed wire monopoly of the BT Group in the provision of broadband infrastructure, especially in rural areas. This has been counteracted to some degree by an increase in access-based competition, which has worked well for most households in the UK. However, meeting the USO requires a shift towards a more diverse mix of infrastructure via competition for the market. Our experience is that this shift may be obstructed by the interests and performance of the incumbent combined with regulatory and public sector actions which tend to reinforce this monopoly position.

31. If a Universal Service Obligation is to mean what it says, Ofcom and the UK Government must act to rebalance their policies as they affect rural areas. There are technologies and providers that can support the appointment of Universal Service Providers at a reasonable cost, even in remote and very thinly populated areas, provided that the hindrances that our members experience on a regular basis are removed. The actions required include changes to regulations and public procurement to allow better use of existing infrastructure as well as any new infrastructure that is put in place.

32. Unless these steps are taken, the promise of universal access to a basic level of broadband service will remain an empty one. The pressure for a USO has been driven by the exclusion of a significant section of the UK population from a service that is regarded as essential for modern life and economic activity. This sense of exclusion will increase if or when it becomes apparent

that the methods of implementing the USO policy simply reinforce the position of an incumbent whose primary interest is to protect their control over a decaying wireline network.

33. There is corollary that we have highlighted in this submission. Reliance upon the BT Group as the main vehicle for extending superfast broadband coverage in the UK has create insuperable conflicts of interest, particularly with respect to the provision of backhaul and access to key infrastructure in rural areas. The issue has been exacerbated by the recent acquisition of EE by BT, which means that a primary source of independent infrastructure- mobile phone masts – is part of the same group. We believe that it is critical that no part of the BT Group should be permitted to act as a USP until or unless the resulting conflicts of interest are fully remedied.

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