

Ordnance Survey

Response to: Designing the broadband universal service obligation - Call for inputs

INTRODUCTION

Ordnance Survey (OS) is Britain's mapping agency, responsible for creating and updating the definitive mapping and geographic information database of England, Scotland and Wales. We provide services, both in Great Britain and internationally, to governments and commercial organisations based on our knowledge, skills and understanding of location data and geography. Established in 1791, Ordnance Survey is today a government-owned company reporting to the Department of Business Innovation and Skills (BIS) and the Shareholder Executive.

Our core business is focused on the collection, creation, maintenance, management and supply of geographic information to meet the needs of all aspects of national infrastructure. In this regard we are heavily relied upon by all utility providers - energy, water and communication infrastructure companies - as well as port, airport and railway operators and the public sector in delivering against regulatory and policy objectives .

OS data is available to over 4,000 public sector organisations, including DCMS, free at the point of use under the terms of the Public Sector Mapping Agreement. Additionally, OS expertise has been used to provide tools and services to assist in the delivery of a number of Government policies. Examples of these include:

- ResilienceDirect : an online tool bringing together disparate data to provide a common operating picture for first responders at times of civil emergency, most recently for the Cumbria floods in December 2015.
- Assisted Areas platform : an online consultation portal to facilitate the Department of Business, Innovation and Skills Assisted Areas Review and help companies establish whether sites across the UK are located within an Assisted Area in order to assist investment planning decisions.
- Land Use Change Statistics : a data analysis service developed by OS from geospatial data to provide a consistent national picture of the implementation of national planning policies, including new builds and housing density.

CONSULTATION RESPONSE

SUMMARY

This response addresses six key questions relating to:

- the specification and scope of a broadband USO (BBUSO)
- likely demand considerations
- cost proportionality and efficiency of the BBUSO
- the universal service provider(s)
- funding a BBUSO
- future BBUSO reviews.

In order to address these we need to start considering what a BBUSO is and what it is there to do. This will shape how the questions are then answered.

We believe that a BBUSO forms part of a wider 'informisation' strategy. Just as the UK once industrialised, so now it must 'informise' to stay connected in the digital age, just as countries like Korea and Japan have already done.

We conclude that two things are urgently needed.

Firstly, a comprehensive economic model to ensure a full and comprehensive analysis of the costs and revenues a BBUSO will generate, not restricted to any subset thereof (whose use might otherwise lead to the wrong regulatory decisions).

Secondly, a national, neutrally-held digital broadband infrastructure asset map to provide improved cost certainty and thereby help to minimise the costs of the BBUSO by providing the evidence base necessary to justify choices made. We stress our willingness to assist in this important work, which is of national importance.

We are already helping directly with this kind of work, which helps to facilitate joined-up government, and thereby helps to avoid unnecessary and avoidable spending of public funds. Our data ultimately underpins some of Ofcom's own work already. It can also help with long range planning, and we are also assisting the both the National Infrastructure Commission and Cabinet Office in this regard.

BACKGROUND CONSIDERATIONS

Government defines the BBUSO as a kind of safety net to ensure that households and businesses can, on reasonable request, get the broadband speeds needed to do business online, to access key services, or to stream live TV. It is ultimately there to ensure that the UK does not end up with a broadband information underclasses. In the digital age, this would not only be undesirable, but it would be economically damaging to have part of the population disconnected.

Broadband is at least as important to the economy as any other kind of national infrastructure; perhaps, many would argue, more so. It is capable of providing wide societal benefits, including helping to meet climate change targets, reducing road congestion and traffic casualties, preventing rural depopulation, offering better connectivity for the emergency services, saving energy, and helping to stimulate competition and choice for consumers. E-government can also reduce the costs of doing business with government, save the government itself money (G-cloud, driving licences etc.), help to reduce NHS funding needs and contribute to better health outcomes by facilitating remote diagnosis, and even assist in times of national emergency whether natural (e.g. flooding) or as a result of human activity (e.g. terrorism).

It is significant that some of the above benefits are not demand-led; that is, the need is not always expressed through market forces. Not all forms of nationally-provided services, for example roads, would have achieved their ubiquity within modern society had the state not played a role in facilitating their development. Today, much that was previously done by the state is now done by the market, including specifically the provision of much broadband infrastructure. This is a political choice. However, the duty of a commercial undertaking to maximise return on investment is not the same as the wider duties of the state. Investment has gone to areas where the returns are most immediate, and we are now left with the question of how best to address the areas where it has not, with EU Commission approval of a role for State Aid already recently secured.

This is therefore perhaps ultimately more of an infrastructure provision question than a speed question. Speed predictions rapidly become outdated - and moreover having them in the first place could distort decisions on what type of technology to deploy to meet the need. A comprehensive opportunity cost analysis of full costs and benefits, plus the timescales over which investments are amortised, could alter technology choices. The economic - and political - consequences of not digitally empowering people could prove very significant. Just ask any MP to comment on how much of their postbag contains 'Broadbad' correspondence. If the underlying aim is a digitally-enabled economy at the lowest cost to the state, then this at least helps us to select the most appropriate course of action. Without better mapping, we contend that this cannot be delivered. We can help, and we stand ready to do so.

SPECIFICATION AND SCOPE OF THE BBUSO

The original Universal Service Order stemmed from Directive 2002/22/EC (on universal service and users' rights relating to electronic communications and services). Via this route Ofcom was ultimately given a duty to ensure 'functional Internet access' of universal service. The Directive thought in terms of service at 28.8kbps. It only came into force a little over a decade ago, yet today we are already talking in this consultation about setting a minimum speed of 10Mbps - orders of magnitude greater. On previous evidence, in ten years from now we could therefore well be thinking in terms of 10Gbps.

The intention not to specify speed in the primary legislation, expressed in the recent DCMS BBUSO consultation, is therefore one with which we agree.

However, can we take a sufficiently accurate forward look to specify any minimum available broadband speed? Might this lead to allocative inefficiencies and potentially wrong choices? All we can be certain of at this time is that demand for the Internet is increasing, at increasing rates, and for increasingly high speeds. Therefore just as 28.8kbps became rapidly redundant, 10Mbps will do too. But then how do we determine what speed is necessary to provide an adequate safety net? Indeed is it even possible - and could it be potentially market distorting to try to do so - since it could skew the choice of technology deployed to deliver service? BDUK and BT are already deploying 24Mbps-capable solutions (and this not being counted as State Aid). As we submitted to DCMS, if there is an absolute need to set a speed, then why

not deliver it over at least a 24Mbps-capable access infrastructure in order to mitigate the risk of setting the wrong threshold speed. After all, this infrastructure is already being deployed. Is the evidence base to justify 10Mbps really robust enough given the potential risks to the economy associated with setting the bar too low, and especially when we know that it is becoming easier to provide faster speeds? What alternative analysis has been considered to provide improved confidence in it? Are we being ambitious enough?

To provide the optimal outcome for citizens and consumers, should we as a country be planning to informise our whole economy to fully exploit the opportunities that the digital age presents - and if so (assuming we realistically have no option anyway), then over what timescales? If such a goal is accepted, or indeed if it is already a government goal, even if not expressed in these precise terms, then one way forward would be to consider a fully comprehensive analysis of the full scope of all costs and benefits USOBB provides. This requires a more joined-up approach to our thinking. What, for example, if all broadcasting services were no longer delivered by Unicast but over the Internet? What would this mean in terms of the need to hold a licence to receive wireless telegraphy signals (that is, a TV licence)? Is this really technically prudent, and what would the value be to the economy of re-farming the spectrum? What then are the impacts on the need for a minimum USOBB speed? Is this all so unthinkable? In fact, a House of Lords committee already asked such questions four years ago.

Such an analysis may be somewhat inconvenient, since it necessarily has an impact on technology likely to be deployed. If we wish to deploy a minimum speed quickly, flexibly and cheaply, then radio is the technology of choice. However, satellite communication has unavoidable latency issues and is bandwidth-limited, whilst in Yorkshire one rural project we heard of began on radio but migrated quickly on to fibre as radio was not able to deliver sufficient bandwidth (though we know of 80Mbps now being delivered wirelessly to cabinets by BT in Northumberland).

Also, if we wish to factor in the importance of high availability and high resilience, then the more passive that network components are, then the greater likelihood that they will be able to withstand adverse weather events such as flooding or other reasonably foreseeable problems (including, for example, the potential for jamming). Since the line-powered Public Switched Network (PSTN) already has a switch-off date set, and since the Internet requires line power from individual premises, such considerations are of great importance.

We also observed in our response to Ofcom's recent IoT consultation that with the continuing trend towards fibre ever deeper into the networks over time, we could see a drop in the value of some low frequency spectrum in favour of ever higher frequencies. However, at even lower frequencies, where one might expect to find low-bitrate long-range IoT devices, we believe that demand will increase. We deduce from this the importance of factoring in 5G and IoT thinking to the BBUSO question. It is difficult to be technology-neutral when all key variables are changing all of the time, and at increasing speed.

We therefore conclude that because of the significant risks associated with a failure to analyse the problem holistically, anything but a fully comprehensive analysis addressing all variables could inadvertently lead to the selection of inappropriate technology deployments. The logical way to address this would be by creating a detailed cost-benefit model that is versatile enough to take account of all variables, and not a subset of them. We are aware in this regard that the 5GIC at the University of Surrey might be well-placed to assist in this regard, and that the London School of Economics has previous expertise in this kind of work. OS could assist too, because two key variables will be (a) ensuring a much more comprehensive and detailed understanding of what current core and access network capability exists at any given location, and (b) helping to more cheaply and quickly assess the impact of local surroundings (hills, rivers, valleys, buildings - even weather patterns) might have on certain types of technology deployment. The statutory power for Ofcom to require the kind of information needed already exists, and much of the data is indeed already available to Ofcom, so the task is largely one of integrating and querying it within a common geospatial referencing framework. This will significantly assist in better understanding questions relating to affordability of provision.

Regarding the need or otherwise for a social tariff, this is an essentially political decision rather than a regulatory one. However, since the government wants to avoid the creation of a digital information underclass, then it follows that such a tariff would be entirely appropriate. However, when making the decision at what speed to set the provision of such a service, one also needs to consider adequately likely trends in what an adequate functional speed should optimally be. For the reasons set out above, we see this as a very difficult task. Without a sophisticated cost-benefit analysis we would not want to comment. We also would stress again that it will be difficult to be technologically neutral when making such decisions, especially in the absence of a completely comprehensive dataset covering all the variables.

Finally in this section we should like to repeat the observations we made to DCMS regarding broadband availability, and the importance of taking a holistic view, not just on peak downstream speeds, but also upstream speeds in addition to other measures including contention ratios, latency, phase jitter, reliability, and mean time to repair, based on comments made by the International Telecoms User Group (INTUG). We would suggest that it would be more prudent (and also lead to better and more future-proof regulation) to focus on a whole informisation strategy rather than to set a speed target in isolation from other wider developments and government policies to which a value can be attached, and which are relevant to the analysis.

COST PROPORTIONALITY AND THE EFFICIENCY OF THE USO

A BBUSO should not be seen as a 'workhouse' solution, to be provided with too much reluctance - though equally no one should assume there is a blank cheque to fund this either. We do not dispute the claim in section 1.15 of the consultation document that 'it will be important to ensure the overall costs of delivering the USO are both efficient and proportionate'.

However, the same is true on the revenue side also. The best solution will be a balanced one which takes properly into account all variables and does not lead to the wrong technology choices being made. There are significant social, political, economic, health and commercial benefits associated with BB provision which have to be modelled. The whole economy can benefit from being better interconnected. Where there are concerns relating to costs of provision of a BBUSO at higher than a flat baseline speed, for example to help with certain types of remote working which involve high bandwidths, then perhaps such higher speeds could be made available for a limited duration only, to enable employers to assess the suitability of candidates who would otherwise be excluded from such job opportunities. Such considerations again point to the difficulty of trying to set a hard baseline BBUSO speed and the difficulties of deciding what the most appropriate technology choice for service delivery in a given circumstance should be.

In light of the above we are not convinced that Ofcom should limit its ambition to seeking views on the cost of provision of the USO based on technologies that are capable of delivering 10Mbps. Technology never stands still. Microtrenching and wayleave charges have a significant impact on the cost of fibre deployment, as does access to duct and pole infrastructure. A single queryable map which is able to accurately show what is where, for radio as well as fixed assets, would help to accurately assess the optimal way to serve a particular location. We strongly recommend that relevant information is maintained and presented at the level of the individual property and not aggregated to postcode areas. Knowing in advance where natural flood plains are prior to siting street cabinets improves resilience, whilst a better understanding of terrain, building composition and weather patterns would assist with decisions relating to radio infrastructure. All the above is possible, and OS already maintains substantial amounts of the required data; our core database is updated 10,000 times every day. If Ofcom and telco operators see merit in a neutrally-held geospatial database providing a single version of the truth that could help to reduce the cost of USO provision then OS has the capability to deliver this.

As touched upon earlier, we also need also to be thinking about the costs of provision in the light of likely paths of network evolution and factoring these considerations into any analysis. We can expect at least three megatrends to hit networks; (a) more local caching of online content, (b) 5G technology, meaning the use of higher frequency radio spectrum, and (c) the deployment of 'network slicing' technology making services easier quicker and cheaper to configure and deploy. We conclude that the next effect will be that fibre will be reaching ever deeper into networks over time (G.fast notwithstanding), and that re-farming lower frequency radio spectrum quickly to ensure its optimal use is likely. This simply reinforces our view of the fundamental requirement to look at all costs and benefits in the round so that the best possible decisions can be taken, and a comprehensive and robust impact assessment completed.

We can see evidence of the fact that take-up is increasing - meaning that despite the correct observation (in section 1.12 of the consultation document) that 8% of the population could

not receive over 10Mbps in 2015, 79% of the population now has a fixed broadband connection, and this number is growing. What the consultation does not discuss (and we do not know either) is what percentage of those who will seek connection might seek to make a reasonable request for BBUSO provision. We suspect that since infrastructure deployments have been market-led for decades, it is very probable that of those remaining to be connected will be those already less attractive to serve commercially with modern infrastructure. If correct, this would strongly reinforce the need for better mapping to clearly understand all the options available to serve a given address most cost-effectively.

In terms of defining 'reasonableness', a long tradition already exists in Common Law. We agree with the comment in section 1.18 that defining reasonableness is an important factor in determining who can benefit from the BBUSO and the overall cost of its delivery. Again, however, just as important are the wider benefits to society in general. From a legal perspective, one might even argue that a legitimate expectation already exists regarding the provision of a BBUSO since increasingly BB will be the default method of interaction between the state and its citizens. From road tax to voting to bin collection - key service delivery is moving online. What if online 'face time' becomes the norm for interactions with Government to further reduce the need for high cost office space? This is entirely possible over time in the context of public sector austerity drivers. Just three high quality feeds at 8Mbps in a house would immediately require 24Mbps - and typical family sizes in the UK are growing. Do we then propose to apportion speeds according to numbers in a household? If the Judiciary decided that the provision of a BBUSO was a basic human right then Ofcom could be faced with having to revisit its whole policy in this area. Again, the difficulty of setting a credible number for BBUSO speed is emerging, along with the necessity of a detailed and robust evidence-based model to support how decisions were reached.

Section 1.24 talks about the importance of ensuring that the overall costs of delivering the USO are efficient and the fact that Ofcom is seeking stakeholders' views on how to ensure the USO delivers efficiency, both overall and on a per-premise basis. We do not believe it is possible for Ofcom to achieve this efficiency objective in the absence of a single neutrally-held and secure asset map. We would welcome discussion with Ofcom to explore how to progress this task, including (if possible) factoring in network sharing as well as helping you to move from postcode to premises level accuracy and additionally to develop improved spectrum mapping. Without the basic tools to better understand what is where on a respected neutral and fully digital mapping platform we can see no robust way to accurately gauge whether or not the efficiency test for BBUS deliver could be met.

THE UNIVERSAL SERVICE PROVIDER OR PROVIDERS

Designating a single universal service provider in the absence of adequately precise data about what network assets are where, and then to calculate the likely cost of supply would be extremely risky, and potentially even the subject of legal challenge later by potentially disgruntled parties, who could with some legitimacy argue that the whole process was flawed.

We contend that it is not possible on the basis of the evidence currently available to assess with sufficient certainty what form a provider might take, nor whether Ofcom should direct a provider (or providers) - or instead have a commercial procurement or reverse auction, such as is foreseen in section 1.27. This decision will necessarily be shaped by the scale of the costs involved set against the totality of evidence-based economic benefits likely to accrue. We have already proposed that a model be created to assess the costs and benefits in their totality.

Were any party to decide to enter a commercial procurement or reverse auction, some of the most basic and fundamental questions it will ask will be about what existing assets are where, what the terrain is like (a key determinant of cost to serve), the precise address(es) within the given geography and the technical options available to them (which might or might not include an allocation of spectrum to deliver the service as well to serve the wider public interest most cost-efficiently).

Ofcom today does not hold such a mapping tool, but has access to geospatial expertise from OS to help establish and maintain this capability. Knowing more about the core and access network assets deployed itself has the further economic benefit of helping all operators better understand what infrastructure (and not necessarily just telecoms infrastructure) is where. As a consequence this will make it easier for operators to maximise their returns on investment by selling or swapping services with each other. This will help avoid excessive asset duplication when there is insufficient funding available today to any single player to upgrade the whole of the UK's infrastructure. By serving one location with BBUSO, it might be possible as a consequence downstream to serve a totally new customer over time with more advanced services, to the benefit of all.

It is essential to establish whether value for money is being delivered - and OS repeats clearly and unambiguously that it can assist Ofcom in this regard. Most of the assets required to build and maintain a precise geospatial mapping model already exist, including a secure and neutral data centre that could host such a solution, in addition to some of the core required data, including key infrastructure assets. We would welcome an invitation to assist you in this regard.

FUNDING OF THE USO AND POTENTIAL MARKET DISTORTIONS

The government has indicated in section 1.28 that '...its preference is for an industry funded scheme', though this is only one of the options available. In a free market it is the duty of operators to maximise shareholder returns, and therefore we expect industry to quite reasonably respond by asserting that funding should be a state responsibility, since if it was economic for private companies to have generated a sufficient return on capital then they would have already provided service to the 2.4 million premises that do not have speeds of 10Mbps or more. We believe that there is an alternative; for industry to work in partnership with government in the wider interests of the State's information strategy, which ultimately

benefits everyone.

When the Post Office was the only provider it was entirely reasonable to expect it to provide a universal service. BT then took on that obligation, and in the 1990s Mercury even discussed the notion that there was such a concept as a Universal Service Benefit - effectively the advantage that accrues to the incumbent by virtue of already having the largest footprint. It is possible to argue here that even in a reverse auction or other competitive bid BT is the most likely winner. This has typically proved to be the case so far, but BT would argue that the whole process was non-discriminatory, proportionate and transparent. We are not aware of any legal challenges to this view. What would be of serious concern, however, would be if the link between consumer pricing and an affordable BBUSO was lost.

Section 1.29 states the importance of building on existing commercial and community networks rather than displacing them, and also of minimising the risk of existing network overbuild. As we have already emphasised in this submission, we see mapping as a way to address such issues constructively. It would also be a help if any data to be analysed conformed to a common set of standards. We understand that this is not the case today for data being supplied to Ofcom. It is in this area that OS, as an independent and neutral party, can particularly assist Ofcom. Geospatial models, specifications and standards have been central to our purpose since 1791, and we can bring much expertise and experience to bear on the problem.

REVIEW OF THE USO

Concerning reasonable levels of use, we have already stressed the need for looking at costs and benefits in their entirety, enabling optimal infrastructure choice and avoiding market distortion. This is a basic requirement before the whole BBUSO process can properly begin, for without this information it is not possible to sufficiently accurately quantify costs and benefits in a robust, evidence-based manner.

Once we have the best available policy tools (including a broadband infrastructure map) in place, only then can we begin to even understand what it is that will be being reviewed. Three things clearly need to be considered:

1. The appropriateness of the connection speed set. We are not convinced that the setting of any speed is ultimately of much help, but if one is necessary and unavoidable then we would suggest that 10Mbps is not sufficiently fast. The evidence base to justify 10Mbps is not particularly great. A failure to set an adequately fast connection speed, particularly in the early days of the scheme, will risk distorting the market and the potential deployment of technology that might not be the most appropriate to provide the most long term benefit to the society that is partially paying for it.
2. The effectiveness of the economic information model which should be used to assess all costs and benefits to the nation associated with BBUSO deployments. Analysis in isolation

will distort the answers.

3. The accuracy and usefulness of the single map which OS could potentially hold and update for Ofcom on a neutral basis in the wider interests of the state, and for the benefit of all, including operators and end customers of a BBUSO alike.

Questions about investment lifecycles and periods of review will become easier to answer both now and into the future if we build the tools needed to do the job up-front.

CONCLUSION

As part of our public task as the National Mapping Agency of Great Britain, we provide advice, support and solutions to the Government on all aspects of survey, mapping, geospatial information and analysis. We are ready to assist Ofcom, DCMS, and others to help ensure that any new BBUSO can be deployed as fast as possible, at the lowest cost possible, to the maximum numbers of users possible.