



Consultation on improving consumer access to mobile services at 3.6 to 3.8 GHz

OS response

December 2016

Responsibility for this document

Ben Nduva is responsible for the content of this document.

Change history

Version	Date	Summary of change
1.0	December 2016	First issue

Approval for issue

John Kimmance, Director of Public Sector

Trademarks

Ordnance Survey and the OS Symbol are registered trademarks of Ordnance Survey, the national mapping authority of Great Britain.

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, Energy and Industrial Strategy (BEIS) 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 objectives¹.

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 Agreement². Additionally, OS expertise has been used to provide tools and services to assist in the delivery of several Government policies. Examples of these include:

- ResilienceDirect³: an online tool bringing together disparate data to provide a common operating picture for first responders at times of civil emergency.
- Assisted Areas platform⁴: 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 to assist investment planning decisions.
- Land Use Change Statistics⁵: 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.

¹ For example, see this interactive map of the National Infrastructure Plan:

<http://demos.ordnancesurvey.co.uk/public/demos/infrastructure/index.html>

² <http://www.ordnancesurvey.co.uk/business-and-government/public-sector/mapping-agreements/public-sector-mapping-agreement.html>

³ <https://www.ordnancesurvey.co.uk/business-and-government/case-studies/resilience-direct.html>

⁴ <http://www.ukassistedareasmapp.com/>

⁵ <https://www.gov.uk/government/statistics/land-use-change-statistics-2014-to-2015>

CONSULTATION RESPONSE

It is the stated aim of Government for UK to be a world leader in 5G, and the Autumn Statement on 23rd November 2016 underlined this priority. Delivering this will not be possible without timely access to additional spectrum. Ofcom's own notes (at 1.1 and 6.2) concerning total data traffic growth across networks in recent years recognise this urgency. Ofcom notes growth of 'around 60% per year' since the publication of its Mobile Data Strategy; however, based on discussions with some major telco operators within the past weeks, we believe that this growth rate is closer to 100% and is still accelerating. The problem of access to spectrum for 5G is therefore even more pressing than Ofcom may think. Time is a serious problem.

The history of spectrum re-farming in the UK is one of laudable aspirations not backed by timely actions. We see two main problems. The first is the perfectly understandable requests of existing users in any band that is due to be re-farmed to seek assurances that if they are moved they will still be able to execute their business plans, or be appropriately compensated (assuming they are even able to move to a different band). To work out who pays compensation and how much is neither a simple nor a cheap exercise and must be done according to due process. A reasonable period of negotiation must be allowed, and the risk of litigation cannot be discounted at any stage. This all adds up, one way or another, to delay. We don't have time if the Government's aim is to be delivered – the 5G train has already left the station.

The second problem we see is that of timely coverage. The needs of 5G and mobile are not patchy, but rather strive to provide full nationwide coverage as quickly as possible without the perennial problem of bottlenecks. For example, a Level 5 connected car can't function if it is only partially connected. However, this consultation has little option but to approach tomorrow's spectrum problems using yesterday's approaches because these are the only tools available and regulation always lags technology.

Regarding auctions and allocation processes generally, it might not even be possible (or desirable) to hold the same kinds of auction as before for 5G deployments given the channel bandwidths that will be needed. This issue and its policy impact is directly relevant to decisions taken about the band. Additionally, the notion that spectrum trading might somehow later fix any allocation problems would represent a gamble when the stakes for our economy are so huge. We accept that Ofcom might quite reasonably feel these problems are outside the scope of this consultation when the issues involved are complex already, and we accept this as fair. They are nevertheless important and relevant in a 5G world.

We do not just want to restate the issues; we would like to help fix them. For example, we believe it would help Ofcom to have access to modelling tools that would enable it to open up higher reaches of the spectrum more quickly, thereby taking pressure off lower bands. While this does not resolve the issue of incumbent users in a band which may be re-farmed, it can assist somewhat, and OS would welcome more extensive discussion with Ofcom and other stakeholders in this area. Likewise, we may be able to assist with work on more accurate exclusion zone planning within the 3.6-3.8 GHz band. We would certainly be supportive of the creation of a spectrum efficiency fund along the lines discussed at the UKSPF cluster meeting in October 2016 that could be used to address the increasingly complex coordination issues arising both in this band and more generally as Ofcom continues to strive for optimal use of the radio spectrum in line with its statutory duties. However, the need for the answers is immediate, and the costs not insignificant.

We see no magic wand that can be waved to fix the problems Ofcom highlights in this band in a fair and equitable manner in a sufficiently fast timescale. Therefore, we suggest that it may be sensible to plan for the first deployments of 5G in the UK on a full nationwide basis using another allocation where this might be possible, even if this is at a much higher frequency. This may also encourage the UK to be *first* in deploying in the IMT-2020 mmWave frequency bands more quickly rather than raising hopes that other options may be available that turn out over time to have been impractical. This strategy would have the obvious benefit of increasing the probability of concluding successful orderly migrations out of the band for existing users, enabling them to operate lawfully and to hold a legitimate expectation that they can continue for some time into the future. It might also stimulate UK innovation to exploit frequencies above 6GHz, where, for example, 5GIC and Bristol University are both doing some excellent work already.

This would be fully in line with Government policy, and indeed following the RSPG opinion relating to 26GHz, this (26GHz) appears to be a band that could address the problems of high capacity and national coverage potential that 5G requires. While it is true that RSPG has designated 3.4-3.8GHz for the kinds of use Ofcom is suggesting, the opportunity cost to the UK of undue focus on this band, which cannot address the core 5G needs, is using up time and resource when both are in short supply. It has been 10 years now since the original EU policy announcements relating to the 3.4-3.8GHz band. There are, we believe, 35 links and 19 Earth Stations in the UK that simply cannot all be moved overnight (if at all in some cases), and for these reasons the UK is not in the position of COMREG in the Republic of Ireland, where the release of the band is imminent. Ten years ago, the IMT-2020 bands had not even been designated... and even had they been, it would have been technically far harder to use them than would be the case today.

We simply don't have time to delay 5G, and neither can we run the risk of being perceived to be trampling on existing usage rights (amounting to property rights), and potentially deterring inward investment into the UK when credible alternatives exist. It is not even up to ground stations which frequencies they receive on, and real technical and co-existence challenges exist. The 3.6-3.8 GHz band is internationally used and not subject to major atmospheric problems, making it particularly attractive to the satellite community. This consultation therefore seems unlikely to be able to deliver what is required fast enough unless the problem we are seeking to address is viewed in the round. A change in one band inevitably has impacts upon others, and there is a significant opportunity cost if we get this wrong.

Question 1: Do you have any comments on the use of the 3.6 to 3.8 GHz band by existing services?

Current use is entirely proper. The desire to make the band available for mobile use is also accepted. It would be optimistic to expect existing users to migrate in a timescale compatible with the Government's aims for 5G deployment in the UK as rapid as possible to help make it a world leader. This presupposes even that they could. When the downlink frequencies are set by satellite operators then unless the frequencies can be changed quickly and cheaply, we foresee problems. Only Ofcom has full visibility of the state of discussions between itself and current as well as potential future users of the band.

Question 2: Do you agree with our identification of a trend towards the use of mobile in the 3.6 to 3.8 GHz band?

The problem is not so much the identification of a trend (original EU policy decisions on this date back 10 years), but rather how soon change could reasonably be effected whilst fully respecting the rights of existing users, and as appropriate, refining exclusion zones so that the UK gets the maximum economic benefit. Using the tools currently available, and based on previous re-farming exercises, one must accept that they are necessarily complex processes fraught with risks of potentially significant delay. We are not convinced that spectrum pricing would be the correct way to encourage change of use either, given the nature of current use and that fact that migration would not be a simple exercise.

Question 3: Do you agree with our high-level proposal to make 116 MHz within the 3.6 to 3.8 GHz band available for mobile and 5G services, bearing in mind our statutory duties and the high-level trends we have identified?

This depends on timing. If Ofcom could achieve band clearance rapidly by mutual agreement, bearing in mind that in Asia the first 5G deployments will be at the 2018 Winter Olympics, then the proposal is timely enough. However, this seems ambitious, so this in turn means there will be a trade-off between having something, a bit of something, or nothing; the latter being a far less attractive outcome. We see significant possible risks of delay as a realistic outcome.

Furthermore, there is a significant opportunity cost consideration to be borne in mind. If instead of focusing on this band, it might be better if Ofcom devoted its resources to enabling the nationwide utilisation of a higher frequency band. Considering the time/cost/benefit implications this alternative approach could have on competition and choice, then this could well generate greater benefits, and generate better for citizens and consumers. Leading in 5G matters.

Question 4: Do you agree with our general approach regarding spectrum currently licensed to UK Broadband?

This is a matter between Ofcom and UK Broadband. We note though that the latter has developed some innovative services.

Question 5: Do you agree with our assumptions, methodology, and conclusions with regards to potential coexistence between mobile and existing fixed links and satellite earth stations? Please refer to annex 5 for further details.

We would observe that Ofcom is going to need far more granular mapping tools than it currently has if it is to be able to manage MMwave spectrum efficiently and effectively. We are ready to assist in this regard if required. However, we have no reason to dispute Ofcom's current findings.

These findings indicate significant disruption, which will inevitably mean it takes time to resolve the resulting issues. We do not believe that the scale of the problems identified can be resolved quickly, thereby calling into question whether Ofcom should instead redirect its limited resources at seeking to open up higher frequencies to 5G as the quickest way to give effect to Government's wishes. Additional alternative spectrum is likely to become available during 2017 anyway due to the MoD release programme.

The key issue in this band, as is so often the case, is without doubt interference management and the appropriate size of exclusion zones, since the band simply will not be cleared in one go. This requires far more precise datasets, and their maintenance over time. OS has the capability to assist in this regard. Ofcom has access to our core datasets already, and we would welcome the opportunity to explore how we might be able to assist Ofcom and other stakeholders with this problem.

Question 6: Do you have a view on any of the two options we identified?

Yes. Any objective should always be Specific, Measurable, Achievable, Realistic and Time-based. We fully understand the complexity of the problem confronting Ofcom, but we could only properly assess this matter based on SMART criteria. Therefore it is not possible for us to take a view. 3.6-3.8GHz cannot be viewed in isolation, but only as part of a wider strategy to achieve the Government's goals. In particular, there is no mention of indicative timescales in the consultation. We also do not know how realistic it would be to move earth stations or mission-critical fixed links that might be being used by the financial services sector swiftly. It would have been helpful to have had this information, because it impacts any assessment of what the best course of action might be. A binary choice is probably not the only option, but we have no way to know this for sure.

Question 7: Do you have any quantitative evidence on the costs and benefits associated with the options? This include costs for existing users and/or consumers of existing services associated with potential changes, and benefits to UK consumers in gaining access to mobile services in this band.

No. However the Government's ambition for 5G *does* have a timescale, and it is common industry knowledge when the first 5G networks are planned to go into service. In Korea it will be 2018, in Germany 2019, in Japan (fully standardised) 2020. We need to be leading 5G so we must raise our game if we are to stay in it. We won't be leading if we are too far behind these *deployment* dates. Better in fact to be in front to attract inward investment post-Brexit.

Question 3 talks of mobile and 5G... but this spectrum appears to be of only limited utility to both, particularly the latter.

Question 8: Do you have any other suggestions that would allow widespread 5G availability using the 3.6 to 3.8 GHz band across the UK while allowing certainty for at least some existing users to continue to provide the benefits currently provided by use of the 3.6 to 3.8 GHz band?

We do not believe that sufficient progress can be managed in a rapid enough timescale to deliver the Government's aims, given the scale and complexity of clearing the band fairly and equitably. Therefore, Ofcom might be wise to question whether enabling only limited access in limited areas offers more or less benefit to citizens and consumers than looking elsewhere for a large amount of contiguous bandwidth, even if at much higher frequencies, and addressing the technical and competition related issues such a policy would throw up. These are tomorrow's problems, but we need to deal with them rapidly or we will fail to be a leading 5G player.

That said, Ofcom is in a better place to weigh up the options than any respondents to this consultation ever could be. Should Ofcom want to devote more resources to seeking what higher frequency

nationwide options for 5G might exist, we would certainly assist. In the interim, more precise work on exclusion zones is required, and not just for this band, but to enable improvements in all bands as part of a joined-up strategy. This may not be cheap, but it is necessary, and will speed up the re-farming process.

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 willing to assist Ofcom, DCMS and others to help ensure that the wishes of Government can be met, as fast as possible, at the lowest cost possible, to the maximum numbers of users possible, and thereby maximise the welfare to citizens and consumers, wherever they may be located.

For further information please contact Ben Nduva, Energy & Infrastructure Sector Manager.

Email: ben.nduva@os.uk

Tel: 07500 815844