

## THE FEDERATION OF COMMUNICATION SERVICES

### **Additional comments:**

The FCS believes that the allocation of radio spectrum in the 700MHz band is as much a political matter as a matter of comparing financial costs and benefits. This is because providers of services of public interest, including the emergency services may have no other band in which to satisfy their future radiocommunications needs. A dedicated spectrum resource may well have to be allocated in this band.

### **Question 1: Have we correctly identified and characterised the potential costs set out above, and what other costs ? if any ? should be taken into account in our assessment?:**

The FCS notes that estimating the costs (including missed opportunity costs) associated with any proposal for radio services in the band is currently impeded by the lack of a comprehensive treatment of the value of the radio spectrum (see Note 1). Thus the cost to the UK of not deploying services of public interest in this 700MHz band is currently not even addressed let alone established.

The LTE global standard is currently in development with a view to possibly including certain features that might make it suitable for use by many public interest service providers, including the emergency services. Whilst there are many questions and doubts remaining in regard to the final condition and timing of these standards and their suitability for these providers, it is already clear that LTE equipment having at least a proximity to the final standard will certainly be made available in this band world-wide, allowing for economies of scale and amortising of development costs. It is unlikely that the same scale opportunities will exist for public services located in other bands.

The UK Government therefore must currently make policy in an environment in which the changes to the LTE standards currently under consideration could well prove inadequate to meet the needs of the providers of services of public interest, including the emergency services. At the same time, the providers may have no other band in which the future radiocommunications services they need to continue to meet their obligations can be deployed. While they have the certain knowledge that if these services of public interest, including the emergency services start to fail in the future, there will be very serious political re-percussions.

The FCS understands there could be very serious cost implications if future UK service providers' radiocommunications needs had to be deployed in a different band. The costs could be viewed as prohibitive. Additionally, due to global resource limitations and the sophistication of the equipment under discussion, a situation might develop whereby the equipment is not made available at any price due to the small scale of the UK market. The UK could be forced to pay a lot more for less.

The FCS concludes therefore that if solutions for public interest users had to be located in other bands, the costs and negative impacts associated with developing an equivalent portfolio for that other band should be included in the costs assessment associated with the use of the 700MHz band by those other services that are allocated spectrum in the band.

The FCS further concludes these costs may be sufficiently high that for all practical purposes, the services of public interest, including the emergency services, may simply have nowhere else to go. The 700MHz band is not, in reality, substitutable because adequate equipment for use in other bands simply does not and may not exist.

It is useful to note that a benefit of using of lower frequencies to provide broadband service is

to reduce the infrastructure costs by taking advantage of the much improved radio propagation compared to higher frequencies such as 2.5GHz or 3.5GHz. Furthermore, the in-building penetration is also much improved at 700MHz compared to those other bands. However, this very advantage has an unavoidable corollary that limits its usefulness towards the mass carriage of air-traffic. This is that the re-use distance is also much increased. So, an area of ground having a consumer population at a given level can be very easily given a good service using by WiFi (say) or similar services at 5GHz or new systems in the proposed 3.5GHz band, given sufficient access points. However, consumers in that same area having to rely on the 700MHz band could well not be provided with the desired service due to the exact same much improved propagation. This arises because the WiFi is short range and so the exact same frequencies could be re-used many times in the area, thus multiplying the air-traffic that can be handled by that frequency assignment. The 700MHz band transmitter may cover that whole area by a signal from a single source and thus lose the multiplier effect. The consequence of this effect is that the 700MHz band may well add some capacity to the services provided using other bands but it won't be as much as would have been the case were the additional capacity to be provided using a higher frequency. In short, this band provides far less capacity to mass market consumer broadband applications than higher frequencies could and probably has less value for mass market coverage improvements once the 800MHz deployment has been completed. Additional deployments to provide the uplift in data air-traffic capacity will inevitably have to be added. This results in additional cost. Instead, it is far more helpful at a policy development level to think of the 700MHz band as adding much improved geographical coverage for services requiring fairly low levels of traffic by comparison to broadband services that can be supported in the higher frequency bands.

The FCS concludes that the 700MHz band is therefore most efficiently and effectively used by services that need much improved geographical coverage but that don't involve huge amounts of data air traffic. Services of public interest, including the emergency services are therefore ideal candidates for allocations within this band.

This conclusion is further strengthened by the way that public safety services tend to operate. They extensively use what is called 'group mode' whereby a large number of users are connected in a single group and only communicate within that group. In a public order situation, up to 1000 persons may be communicating in the same group. Thus the wide area coverage provided at the lower frequencies simplifies the telecoms architecture.

The wide area coverage advantage of lower frequencies is also an asset when resilience from mains power interruptions has to be added to a network as is usually required for public safety networks. Not only do the lower frequencies enable networks to be constructed with significantly fewer base stations, reducing the cost of building and maintaining a resilient network, but the network architecture requires less backhaul links, which must also be resilient and duplicated for resilience.

For the avoidance of doubt, the FCS considers the need for radio spectrum to be made available to services of public interest is a completely different and separate topic from a dedicated radiocommunications network. It is well established that during incidents etc. these professional operational services must keep working irrespective of the load on the public networks. Thus segregated spectrum is required. The delivery mechanism is a matter beyond the scope of this response. However, it is equally important to note that the actual equipment used by key services may be different from that used by consumers even though it operates in the same frequency range and perhaps even on the same network using its own dedicated spectrum resources. This is because there may be operational requirements that demand very much improved ruggedness and different services etc.

Note 1: The Analysys-Mason study, "Impact of radio spectrum on the UK economy and factors influencing future spectrum demand, 5 November 2012" by agreement, specifically excluded services of public interests. Many of these services are obvious candidates for deployment in the 700MHz band,

**Question 2: What evidence, whether qualitative or quantitative, should we obtain and/or take into account in assessing each of these potential costs? Please identify any sources of specific evidence to which we should have regard.:**

It is understood by the FCS that Ofcom is aware of the studies on the societal benefit and value of the use of the 700MHz band by the emergency services that are in preparation. It is therefore assumed that when available, these studies will be included in the considerations of the management of this band.

The European Utility Telecommunications Council (EUTC) has also undertaken work on the socio-economic benefit of spectrum used to support the operations of the utility networks. The conclusion of their study was that the societal benefit of spectrum used by the electricity industry to ensure reliable operation of the electricity supply network may have a societal benefit 50 to 150 times the economic value of the electricity itself. (see Note 2)

The FCS would also recommend that Ofcom undertakes discussions directly with the suppliers of radio systems to obtain confidential views on the costs associated with developing emergency services radio communication equipment were these to be located in other bands.

However, it is recognised that this discussion is at present impeded due to the current lack of clear requirements statements from key organisations that are charged with these definitions. It is expected that these requirements statements could be available early in 2014 or perhaps the end of 2013.

Note 2: <http://eutc.org/socio-economic-value-spectrum-utilities>

**Question 3: Have we correctly identified and characterised the potential benefits set out above, and what other benefits ? if any ? should be taken into account in our assessment? :**

As noted above, the analysis in the consultation is impeded due to the lack of an officially recognised and current study on societal benefit arising from the use of mobile broadband services of public interest in the 700MHz band. However, it is anticipated that significant benefits from the use of the band for mobile broadband services supporting the emergency services will be shown. The FCS understands that such studies are in progress (including European studies) (See Note 3). We anticipate that such studies that are in progress may help to inform the spectrum work.

In the meantime, studies have been conducted in other regions which have consistently demonstrated that there are benefits that accrue from the use of broadband spectrum by emergency services that outweigh the potential loss of auctions revenues.

Some statistics from studies in other parts of the world show the value of broadband services to emergency services:

- 90% of defendants plead guilty when captured on video (IACP 2000)
- 89% of public safety decision makers believe data is as mission critical as voice (Motorola Solutions survey, 2012)

Furthermore we can make reference to:

- Cost analysis of crimes and disasters done in Germany: PPDR Spectrum Harmonisation in Germany, Europe and Globally, Study for the German Federal Ministry of Economics and Technology (BMWi), WIK-Consult 2010.

- Work done in Asia: John Ure (2013), "Public Protection and Disaster Relief (PPDR) Services and Broadband in Asia and the Pacific: A Study of Value and Opportunity Cost in the Assignment of Radio Spectrum".

The FCS notes however that this consultation in question 1&2, seeks to establish costs and benefits as measured in financial terms. Such an analysis is clearly valuable when considering consumer services. However, the 700MHz band will be used to support services of public interest and emergency services in many countries. As noted in the response to question 1, this could result in the non-availability of suitable equipment for use in other bands (See note 4). The UK will almost certainly have to align with the international community eventually. This being so, the uses to which the band is put ceases to be simply a matter of comparing financial benefits and costs, the inclusion of services of public interest expands the question into the political arena. The 700MHz band will have direct relevance to the future achievement of the prime role of government in the UK. If the band is inaccessible to UK services of public interest and equipment is not available in other bands at an affordable price, those relevant services of public interest will not exist in the UK. That may be incompatible with the achievement of future goals for public safety and the provision of the wide range of services our society will need going forward. This failure is likely to be visible to the general public.

Note 3: The FCS is further aware of work done by individual companies to provide indications of the value of the activities of the emergency services in financial terms. In addition, this work provides some indication of the savings that could be achieved as a result of the deployment of mobile broadband for the emergency services.

Note 4: Except at the extremely high cost associated with the development of UK-specific equipment as noted in question 1.

**Question 4: What evidence, whether qualitative or quantitative, should we obtain and/or take into account in assessing each of these potential benefits? Please identify any sources of specific evidence to which we should have regard. :**

See answer to question 2.

**Question 5: In particular, what is your view of the likely future demand for additional sub 1 GHz spectrum for the provision of mobile data services, and what evidence supports this view?:**

The FCS notes that mission-critical mobile data and mobile broadband services have hitherto not been extensively used in operational communications.

It is extremely unlikely that this will continue. The complexity of delivering the public obligations rises all the time and so, given limited human resources, the need for ever-greater operational efficiency is assured. Much greater sophistication in all aspects of service delivery is inevitable and this includes operational communications. High-grade, mission-critical wideband and broadband mission-critical communications will certainly be required by many providers of services of public interest, including the emergency services.

It is also worth noting that with the increase of use, the amount of radio spectrum currently devoted to current systems is fast becoming insufficient. Steps will have to be taken to improve the situation. One possible improvement is to aggregate many low data rate communications onto fewer high data rate communications circuits. Much work needs to be undertaken before such approaches could be considered viable in a mission-critical environment.

**Question 6: Should we place different weights on some costs and benefits than on others, for example depending on whether costs would be borne by consumers, DTT operators, or mobile operators? :**

The FCS notes that the consumer bears the costs directly or indirectly. It is therefore not clear how this approach assists the discussion. The FCS therefore makes no contribution on this point.

**Question 7: Do you have any other comments on the work we are currently undertaking on potential costs and benefits? :**

The FCS believes that in relation to the services of public interest, the costs and benefits are not merely financial but also political. There could easily be political repercussions (costs) associated with important services not being available as a result of any decision to not accommodate the necessary operational communications in this 700MHz band.

**Question 8: Have we correctly identified the costs and benefits that could vary depending on the timing of release, and the impact of those factors? Are there other costs and benefits which would vary depending on the timing of release of the 700 MHz band which we should take into account?:**

The FCS notes that the earliest spectrum availability noted in the consultation is 2018. This is very early and may prove difficult in practice to achieve.

The enhancement of the standards to include all of the necessary facilities for the emergency services could take until 2017. This being so the equipment resulting from that standard set could be expected to be available sometime in the 2018-2020 timeframe if everything goes well. Elsewhere in the world, emergency services are already deploying services based on LTE standards. An early release could allow the benefits of data services to be realised sooner because it provides greater certainty.

**Question 9: How quickly could the 700 MHz band be released? What would be the impact on DTT infrastructure costs of releasing at the earliest possible time compared to a later time? What would be the factors which affect these costs?:**

No comment.

**Question 10: How, and to what extent, are the costs for existing (PMSE) and potential (WSD) interleaved users of the 700 MHz band likely to vary depending on the timing of release? What would be the factors which affect these costs?:**

No comment.

**Question 11: Should we consider any other cost-related arguments / evidence in favour of an earlier or later release date?:**

No comment.

**Question 12: What would be the impact on mobile broadband delivery and competition of releasing the 700 MHz band later rather than sooner? :**

No comment.

**Question 13: Should we consider any other benefit-related arguments / evidence in favour of an earlier or later release date?:**

The FCS considers that the key issue at this stage is to confirm that there will be spectrum dedicated to supporting the operational communication of services of public interest, including the emergency services.

Once the necessary spectrum has been identified, the remainder can be assigned in the desired timeframe.

**Question 14: Is the range of potential dates for release likely to be wide enough to merit consideration of an incentive auction approach?:**

As noted in the DCMS Seminar (2012) (See note 5), several key user groups are not in a position to participate in an auction (of any type). These at least will have to be catered-for using a Direction under the existing procedures.

Other sectors may well consider an auction to be appropriate. The FCS does not comment on auction design.

Note 5: Seminar 3: Maximising the value of spectrum to support growth and innovation in the market

**Question 15: If so, what are the challenges to designing an effective incentive auction in this case, and how might these challenges be addressed? :**

See answer to question 14.

**Question 16: If we followed an incentive auction approach, how should we take account of wider costs and benefits ? i.e. those not felt by participants in the auction?:**

See answer to question 14.

**Question 17: Do you have any views at this stage as to the parameters of an incentive auction, such as the default date and payment mechanism?:**

See answer to question 14.

**Question 18: Is there a version of the overlay auction approach which could be suitable for 700 MHz release?:**

See answer to question 14.

**Question 19: What are the benefits and risks of conducting an overlay auction in this case?:**

See answer to question 14.

**Question 20: Have we correctly identified and characterised the potential impact of 700 MHz release on consumers accessing DTT? What other impact ? if any ? should be taken into account in order to identify pre-emptive measures to reduce this impact?:**

There is no need for TV viewers to lose any DTT services due to the clearance of 700 MHz. Ofcom should make sure that, after clearance, there is enough spectrum for all of the DTT multiplexes with the same coverage as they have today. This will be possible by moving DTT from the 700 MHz band to the 600 MHz band (so long as DTT can use Channel 48 without harmful interference) and by transitioning to DVB-T2. If 700 MHz is cleared then the entire platform should migrate to DVB-T2 at the same time. This would minimise the disruption of two transitions and to make the most efficient use of the available spectrum.

**Question 21: Do you have any comments on the pre-emptive measures relevant to DTT identified above? Are there other pre-emptive measures we should be considering?:**

No comment.

**Question 22: Have we identified the correct measures to support consumer adoption of DVB-T2?:**

Moving the entire DTT platform to the more efficient DVB-T2 standard is a sensible move to allow a wider range of services. Therefore any measures to encourage consumer adoption of DVB-T2 should be supported.

**Question 23: What regard, if any, should we have to wider technical evolution of the DTT platform, such as HEVC? :**

No comment.

**Question 24: Have we correctly identified and characterised the potential impact of 700 MHz release on PMSE users? What other impact ? if any ? should be taken into account in order to identify pre-emptive measures to mitigate this impact?:**

No comment.

**Question 25: Do you have any comments on the pre-emptive measures identified above? Are there other pre-emptive measures we should be considering?:**

No comment.

**Question 26: Do you have suggestions for how we can assess the impact on PMSE users and equipment if 700 MHz is no longer available for PMSE use?:**

No comment.