Professor Stephen Temple CBE

Your response

Question	Your response
Question 1: (Section 4) Do you agree with our proposals on the coverage obligations as set out in this section? Please give reasons supported by evidence for your views.	No comment
Question 2: (Section 5) Do you agree that we have identified the correct competition concerns?	No comment
Question 3: (Section 5) Do you agree with our assessment of these competition concerns, and our proposed measure for addressing them? Please give reasons supported by evidence for your views.	No comment
Question 4: (Section 6) Do you agree with our proposal to proceed with a conventional assignment stage?	No comment
Question 5: (Section 7) Do you agree with our proposal to use a CCA design for this award?	No comment
Question 6: (Section 7) Do you have any comments on the proposed detailed rules for our CCA design?	No comment
Question 7: (Section 8) Do you agree with our proposed approach to coexistence in the 700 MHz band?	No comment

Question 8: (Section 8) Do you have any comments on the proposed licence obligation and guidance note (annex 19)?	No comment
Question 9: (Section 9) Do you agree with our proposed approach to managing interim protections for registered 3.6-3.8 GHz band users?	No comment
Question 10: (Section 9) Do you agree with our 3.6-3.8 GHz in-band restriction zone proposals?	No comment
Question 11: (Section 9) Do you agree with our view that we do not need to include any specific conditions in 3.6-3.8 GHz licences to mitigate the risk of adjacent band interference?	No comment
Question 12: (Section 10) Do you agree with the non-technical conditions that we propose to include in the licences to be issued after the award of the 700 MHz and 3.6-3.8 GHz bands?	**ROAMING** Sections 10.22 and 10.23 This year is the 30th anniversary of the DTI Consultation Document *Phones on the Move* that proposed, <u>for the first time anywhere in the world, *four competing mobile network operators*</u>. As the author of *Phones on the Move,* I find it heartening to see Ofcom still attaching importance to this competition model. It has served the UK well. However, there is one specific area where the model has underperformed. That is in the delivery of coverage to the extent demanded by consumers and industry and, in particular, the persistence of coverage "not spots". My observation over the past 30 years is that the four competing MNO model delivers a much faster roll-out, then the competitive drive to keep improving coverage significantly dims and the model finally acts negatively in strongly entrenching coverage "not-spots". The Consultation Document touches on the "not spot" issue in para 10.22, which states "We do not rule out the possibility of looking to impose roaming conditions, as appropriate, in

	700 MHz licences in the future. This potential measure is far from ideal. First, Ofcom are partially undermining its effectiveness for low data rate services by being "band neutral" in the proposed national coverage obligations. Therefore, "not spots" in coverage, using these other bands, would not be addressed. Second, 30+30 MHz at 700 MHz, potentially spilt four ways, does not offer much capacity for roaming in the 5G enhance mobile broadband age that lays ahead. Why it is timely to put the "not-spot" issue on the table in response to this consultation is that the next generation of "not spots" is *already being incubated* in the 3.4 – 3.8 GHz band roll out plans for 5G. Three of the four MNO's have announced the cities and towns for their initial 5G roll out. From these, I estimate that around 33% of the population are to be covered in total, which is not bad for the launch phase of a roll-out. However, the more revealing numbers are that only 14% will be covered by all three operators, 23% by two operators and 27% at least by a single operator. These absolute numbers are of less importance than the warning signal of a fresh wave of coverage not-spots are on their way. In due time the 5G coverage not-spot area is likely to shrink in dense urban areas under competitive pressures but rise sharply outside of dense urban areas, where subsequent roll-out phases will be far more capacity driven. The different geographic profile of capacity peaks between MNO's and different cell edge capacity troughs between site sharing groups will lead to the balkanization of the 5G coverage provided. Ofcom (and the government) need to think now how the 5G mobile not-spot issue can be addressed. The only measure included in this consultation document is the possibility (and only a possibility) of a 700 MHz national roaming obligation. That is of no help to a high capacity low latency 5G network at 3.6 GHz. It is unrealistic for Ofcom (and the government) to want competition to drive out 5G coverage and then use the imposition of roaming to wipe

	out the coverage leader(s) price premium for having the better network, particularly against a backdrop of EU policy for roaming prices to drop to zero. The problem needs a fresh approach, where the solution is something that can be bolted on top of the four competing MNO model rather than replace it, has incentives for MNO's to extend their business models to embrace it and changes the psychology of roaming in both the minds of the MNO's and the regulator. The regulatory change of mindset is for roaming to no longer be seen as something that has to be a part of the basic service and "free". The MNO change of mindset is to view roaming as "premium service" that consumers and businesses are likely to value and pay for. This is in line with the 5G trend of thinking of "the network as a service" offering differentiated packages that can command a price premium in line with their enhanced value. This in turn rewards investment in 5G. What is potentially powerful with this approach to roaming is that it can be readily extended to network resilience. The total collapse recently of one of the mobile networks for an extended period is still fresh in our minds. Two MNO's entering into a back-to-back contract for roaming could do the same for network resilience *within the same deal*. There is no material difference between a local cell failing and a user driving into a local coverage not-spot. The deal would need to be between MNO's in different site sharing groups to drive out many coverage not-spots. In the event of one network (or coverage) failing, premium customers on that network would automatically get connectivity on the back-up network. The premium "price" acts as a market-oriented tool to limit total numbers so as to ensure the back-up network can handle the surge in traffic from the failed network without unduly affecting the quality of service for their own customers.

Such a 100% network redundancy would be the largest possible leap in mobile network reliability for the least investment, as it utilises what exists. Furthermore, a growing number of consumers and businesses will hugely value enhanced reliability in an age of ever-growing dependence on mobile networks. Adding enhanced reliability into the mix of differentiated network products strengthens the 5G "network as a service" opportunity. The government review of network resilience (that Ofcom is involved in) offers the opportunity to encourage MNO's to go down this path.

The third argument for this approach to roaming is that it offers a route to a solution to 5G coverage balkanisation. International roaming is a "federated coverage" model and national roaming of the type proposed would be similar and allow balkanised 5G coverage to be brought within a contiguous 5G coverage area *as a premium service*. If the government's market expansion model is also brought into the mix with the IET 5G-FF shared spectrum access model (that seeks to link MNO's with privately provided 5G coverage), then the UK would have a road map to near national 5G coverage *for those who value it the most*.

The political and policy price to be paid is that the extent of contiguous coverage would go the way of data speeds and data caps…a basic offer onto which consumers can pay more to get more.

I invite Ofcom to test this model against alternative policy options for addressing coverage not-spots and likely 5G coverage balkanisation. "**Roaming as a premium service" is radical, practical and has the merit of being market driven, once off the ground. To enable it requires**:

- Leadership from Ofcom (and the government) in stating an objective of seeing such a model emerge
- Ofcom accepting roaming and 100% network resilience as a "premium service" that consumers and businesses value and are prepared to pay for.

	❖ At least two MNO's being willing to embrace the future of "networks as a service" and put premium roaming and/or network resilience products on the market. ❖ Ofcom not blocking the first two MNO's making such an offer to the market on the basis that all four MNO's have to offer it, or nobody is allowed to offer it. ❖ The government helping to get this off-the-ground through a recommendation emerging from its review of network resilience. It could also use its procurement powers to seek back-to-back network resilience for the mobile services it buys. ❖ Ofcom allowing the market time for the model to extend down into the mass consumer base as 5G high capacity networks become more extensive and can handle larger sudden surges in traffic. This contribution touches a number of different policy areas, including persistent failure of competition to address coverage not-spots, national roaming, mobile network resilience and 5G coverage risks of balkanisation. I hope that officials concerned with these different but related policy issues find this a helpful input in modernising the venerable four competing mobile network operator model for a 5G age.
Question 13: (Section 11) Do you agree with the technical licence conditions we propose?	No comment