

## Response to the consultation questions to be found in the “Enabling opportunities for innovation” dated 18<sup>th</sup> December 2018:-

Question 1: (Section 3) Do you agree with our proposal for a single authorisation approach for new users to access the three shared access bands and that this will be coordinated by Ofcom and authorised through individual licensing on a per-location, first come first served basis?

FMS holds a 1800MHz guardband CSA licence and has enjoyed the flexibility of self-managing the spectrum within the constraints of the licence and the Mobile200 Engineering Code of Practice (ECoP).

The FMS product range is limited to private networks e.g. mobile extensions to pbx's, local data networks etc. Public network have not been possible because of the lack of roaming agreements with the MNOs. Some installations have been complex i.e. multi-floor buildings and some temporary e.g. conferences and county shows.

FMS recognises that many of the CSA licences have remained unused and that situation might be sustained if CSA auction type licensing was extended into the 2.3 and 3.8-4.2GHz bands. The link between paying a lot and using it a lot has not been demonstrated, so FMS is sympathetic to the coordination and authorisation of shared spectrum access by Ofcom. FMS's concern is with the how, not the why.

- (a) This proposal puts Ofcom on the critical path, so Ofcom needs to offer an SLA. Alternatively, a presumption of prior approval on the basis that the customer carries out sufficient work for the licence application to include frequencies, codes, identities etc.
- (b) It is not clear in the proposal who does the frequency or code planning in a multi-base station application. If Ofcom is issuing frequency channels, then it must take into account the cellular use of the frequencies, not just the interference aspects. The same applies to code planning. FMS suggests that Ofcom's core expertise is interference management and not building cellular networks, so Ofcom is not best placed to coordinate frequency and code reuse in complex networks. There is the additional aspect that the customer may have carried out test transmissions and coverage surveys to support their application – does Ofcom have this capability? The essence of a good cellular network is its frequency/code planning and if Ofcom takes this on then it becomes responsible for the quality of service of the network and its competitors. FMS suggests this is not a good place for Ofcom to be.
- (c) Cell identities and other broadcast parameters – who defines them? For example, the cellID, it presumably comes from the Ofcom licensing process as there has to be a record of where a cell is located. Has Ofcom considered the implication of managing a UK wide cellID and associated broadcast identifiers plan?
- (d) The ECoP allows for a femto-cell with exclusive use of the two outer channels, in effect, creating guardbands. The femto has a maximum EIRP of 3dBm and equates to

domestic DECT and WiFi products and as such could be deployed without recording its existence in the Mobile200 database. The point being that femto's came under the umbrella of the CSA licensee who does know their identity and location, but as with DECT and WiFi, there is no public record of them. There is no provision in the licensing proposal for such a product, so currently each femto would require its own licence with associated fee, which doesn't equate to DECT and WiFi.

- (e) The licence by auction process does imply some link between the applicant and their technical capability. When anyone can apply for a per base station licence then the implied expertise goes and there is a greater risk of poor installations. FMS has frequently encountered the IT based view that a cellular base station is just another AP on the data network and without an understanding of cellular, such systems have frequently failed to deliver.
- (f) It follows from making the shared spectrum available to anyone on a per channel per location basis that a CSA licensee's customers could desert them overnight and apply directly to Ofcom for spectrum access. In effect, the asset value of the current CSA licence disappears with a consequential impact on the value of the Business. Ofcom needs to be mindful that several CSA licensees whose businesses are based entirely on their licence may well be severely impacted.

The proposed assimilation of the CSA base stations into an Ofcom process amounts to a revocation of the CSA licenses as each base station is re-licensed to a Company that becomes a Service Provider overnight, no longer a network. Other licence revocations carry a five year implementation, the proposed licensing change is uniquely abrupt.

Question 2: (Section 3) Are there other potential users in the three shared access bands that we have not identified?

No comments.

Question 3: (Section 3) Do you have any other comments on our authorisation proposal for the three shared access bands?

FMS has also responded to the 700MHz and 3.6-3.8GHz bands consultation document and noted in it the "use it or loose it" discussion, Section 10.18. The implication is that unused spectrum in the 700MHz and 3.6-3.8GHz bands could be made available to secondary users on a per base station basis as in the shared access proposal. FMS notes and agrees with the proposed Local Access licence as a way of third parties achieving this.

Question 4: (Section 3) What is your view on the status of equipment availability that could support DSA and how should DSA be implemented?

FMS has no exposure to, or knowledge of such equipment.

Question 5: (Section 4) Do you agree with our proposal for the low power and medium power licence?

FMS welcomes the provision of a medium power base station.

FMS suggests that provision should also be made for a 3dBm Femto base station that could compete directly with domestic DECT and WiFi products. Below this power level are the wideband short range radio products e.g. intra-office communications that also need a simplified licence provision.

Question 6: (Section 4) Are there potential uses that may not be enabled by our proposals?

No comments.

Question 7: (Section 4) Do you agree with our proposal to limit the locations in which medium power licences are available?

FMS is pleased to see the flexibility built into the proposal.

Question 8: (Section 4) Do you have other comments on our proposed new licence for the three shared access bands?

No additional comments.

Question 9: (Section 4) Do you agree that our standard approach to non-technical licence conditions is appropriate?

FMS agrees with the proposed standard approach.

Question 10: (Section 4) Are you aware of any issues regarding numbering resources and Mobile Network Codes raised by our proposals which we have not considered here?

FMS is not aware of any issues regarding numbering or Network Codes (MNC's).

Question 11: (Section 5) Do you agree with the proposed technical licence conditions for the new three shared access bands?

No comments.

Question 12: (Section 5) Are there other uses that these bands could enable which could not be facilitated by the proposed technical licence conditions?

FMS is not aware of any other uses for these bands. However the 3.8-4.2GHz band does lend itself to wideband short range radio systems that might adopt non-cellular technologies. The developers of such technologies would be aware of the out of band block emissions requirements and either conform to them or seek a variation through Ofcom.

Question 13: (Section 5) Do you agree with our proposed coordination parameters and methodology?

FMS agrees with the proposed coordination parameters.

Question 14: (Section 5) What is your view on the potential use of equipment with adaptive antenna technology (AAS) in the 3.8-4.2GHz band? What additional considerations would we need to take into account in the technical conditions and coordination methodology to support this technology and to ensure that incumbent users remain protected?

FMS is cautious about claims for adaptive antenna technology, particularly as a means of extending the coverage footprint of a base station. The complexity of the systems forces the entire base station to be physically integrated into the antenna bay which increases the cost of the technology, its support structure has to be significantly more substantial and there are maintenance issues. It may prove to be more economic to just build more sites.

There is also the issue of EIRP, in that the proposed licence is in EIRP and that limits the coverage using whatever technique.

Question 15: (Section 5) Do you agree with our proposal not to assign spectrum to new users in the 3800-3805MHz band and the 4195-4200MHz band?

FMS has no views.

Question 16: (Section 6) Do you agree with our fee proposal for the new shared access licence?

The proposed fees are £80 pa per 10MHz channel per location, or for multiple base station in an area with a 50m radius.

Two base station power levels (EIRP's) are proposed, 24dBm (low power) and 42dBm (medium power). The medium power base station carries additional geographic restrictions.

FMS welcomes the provision of a medium power base station.

Assuming £80 pa per 10MHz channel:-

- (a) Why is it a per annum figure as there are no obvious recurring costs?
- (b) How will the summer season of temporary sites be costed – surely not on a per location basis as typically they last for a week and then the same devices appear somewhere else in the country. Treating each temporary location as a permanent installation and charging £80 a time seems unreasonable.
- (c) Femto cells in the 1800MHz CSA band are currently only known to the CSA licensee but become individually licensable in the new proposal i.e. £80 a time. The product is intended to compete with domestic DECT and WiFi that are licence free. In FMS's opinion, some alternative, more appropriate costing/licensing is required.

- (d) Section 7.16 deals with how the new licensing fees will be applied to existing CSA licensees. It implies that the CSA licensee will take a hit of £80 per active base station on the transfer of the data from the Mobile200 database into the Ofcom equivalent. This amounts to a tax that FMS considers unreasonable. The licensing change is not of FMS's making, so it should not incur any cost. FMS is happy that future base stations attract the Ofcom fee's, but consider that the existing active base stations have already been bought and paid for.

Question 17: (Section 7) Do you agree with our proposal to change the approach to authorising existing CSA licensees in the 1800MHz shared spectrum?

It follows from making the shared spectrum available to anyone on a per channel per location basis that a CSA licensee's customers could desert them overnight and apply directly to Ofcom for spectrum access. In effect, the asset value of the current CSA licence disappears with a consequential impact on the value of the Business. Ofcom needs to be mindful that several CSA licensees whose businesses are based entirely on their licence may well be severely impacted. FMS advocates further consultation with the impacted CSA licensees.

The proposed assimilation of the CSA base stations into an Ofcom process amounts to a revocation of the CSA licenses as each base station is re-licensed to a Company that becomes a Service Provider overnight, no longer a network. Section 4.24 refers to a five year notice to revoke period; the proposed change to the CSA licence is uniquely abrupt.

Question 18: (Section 8) Do you agree with our proposal for a Local Access licence?

FMS agrees with the proposal for a Local Access licence adopting the T&D licensing process.

Question 19: (Section 8) Do you have any other comments on our proposal?

No further comments.

Question 20: (Section 8) What information should Ofcom consider providing for potential applicants in the future and why would this be of use?

FMS is concerned about the technical competency of potential applicants. Those familiar with cellular or UHF radio should have researched their application before making it. Those lacking such competency presumably expect Ofcom to carry out the necessary background work. FMS suggests that some kind of technical hurdle is placed in the process, such as evidence to support the application as a demonstration of competence.

Question 21: (Section 8) Do you agree with our proposal to have a defined licence period and do you have any comments on the proposed licence term of three years?

In FMS's opinion the three year tenure is a one-size-fits-all figure that satisfies no-one. Its not long enough to provide business security and too long for an MNO whose planning cycle is typically 12 to 24 months. It should be obvious to a competent applicant whether the

proposed location is in a busy area or a remote area and FMS suggests that these too cases come with different tenure expectations. Consequently FMS suggests that Ofcom considers some flexibility around the licence term.

Question 22: (Section 8) Do you have any other comments on the proposed Local Access licence terms and conditions?

No additional comments.

Question 23: (Section 8) Do you agree with our fee proposal for the new Local Access licence?

FMS notes the proposed one-off fee of £950 per Local Access licence. However, if additional tenure periods are added then the fee should be proportional.

### Additional comments:-

Whilst FMS welcomes the provision of additional spectrum to support new innovative uses, it has two concerns:-

- (a) The 3.8-4.2GHz band is not currently a usable cellular band and therefore there are no terminal devices available. By licensing access to this band Ofcom are hoping to promote the development of supportive equipment. However Section 3.4 acknowledges that such equipment would be for bespoke 5G systems. The most likely use of the band would be for non-cellular applications that capitalise on its wideband and relatively short range characteristics.
- (b) The other two bands; 1800 and 2300MHz are recognised cellular bands supported by terminals. The 1800MHz guardband is already awarded to the CSA licensees, whilst the 2390-2400MHz band is occupied by the MOD. 2G and 4G services will fit into these bands, making public networks possible.

There is a business case for third party coverage suppliers with low overheads and innovate products to offer mobile phone services in rural remote areas of low population density. The equipment is currently available and Ofcom is now making additional spectrum available that enables such rural coverage solutions. Actually, such infrastructure has been available for some time, but there has been no successful deployments in the existing 1800MHz guardband because the systems have been isolated from the greater cellular world.

There is no traction or interest in an isolated patch of mobile phone coverage if it needs its own SIMcard to access it. Such a phone cannot be used elsewhere in the UK and there is the complication additional contracts and billing.

The issue to date has been the lack of national roaming (albeit inbound roaming) from the UK MNOs. FMS has tried for several years to get such agreements that would enable a seamless service to the remote customers.

National roaming has long been resisted by the MNOs, which in FMS's opinion has been the correct attitude given the calls to homogenise their collective coverage. The bitterness that remains after several attempts to introduce national roaming has meant that any mention to the MNOs of anything that resembles national roaming immediately terminates the discussion.

It is against this background that some of the 1800MHz guardband licensees have sought to provide localised coverage and consequently, supportive roaming agreements with the MNOs. There have been some one-way roaming agreements where New Network customers can, in the absence of their local coverage, attach to a National Network, but not vice-versa. This is very much a third class service and has attracted no business, a situation that will not change until full national roaming is achieved.

Consequently, FMS and others have avoided using the provocative "national roaming" phrase in an attempt to open reasonable conversations with the MNOs – the phrase has become the elephant in the room!

FMS has directly approached all the UK MNOs with partial oblique interest from only one. Some MNOs would not even discuss rural third party roaming, not even returning calls or letters.

FMS attempted to join the GSMA as a route to the MNOs table, but at the time, the GSMA had a policy of excluding the 1800MHz guard-band operators, so the established roaming path established by the GSMA was denied to FMS.

FMS has approached several non-UK MNOs who have roaming agreements with all the UK MNOs and who offer roaming hub capabilities - none would support the FMS product concept. Despite being technically possible, there was a fear amongst these roaming hub Operators that such arrangements might be seen in a negative light by the UK MNOs, so they were unwilling to support FMS.

Even if an MNO was minded to support third party roaming there are two further obstacles; (a) the call charges – the rural customer should pay the same call charges as city customers, but the third party network earns money from the transiting traffic so the MNO has to pay. And (b), interconnect testing – currently this costs the third party network several hundred thousand pounds per MNO and there is a queue based on the perceived value to the MNO.

If the initial knee jerk reaction to national roaming can be overcome, there is opportunity for a fruitful discussion:-

Firstly, this is not national roaming, it is localised roaming, anywhere there is an absence of the MNO coverage.

Secondly, there are no new SIMcards, so MNOs retain their customers who now benefit from using their phones in places they previously couldn't.

Thirdly, the customer sees the calls on their existing MNO bill – no extra billing is required.

Fourthly, as long as there is a signalling interconnect, full roaming is not required, only inbound roaming where the MNO re-directs incoming calls and text messages to the mobile when it's on the Roamed Network. All other call modes can be near-end handed off directly to the PSTN, all that is needed is a record of each event to support the billing.

This is third party coverage and is a benefit to the National Operator, not a threat. The really innovative Operator might even go further and consider handing over its service delivery in the truly remote parts of the UK to the third party network.

Whist FMS recognises that the "Enabling opportunities for innovation" initiative has come from Ofcom's spectrum management team, Ofcom as a whole needs to understand that spectrum is only half the solution and national roaming is the other half. Section 10.22 of the 700MHz & 3.6-3.8GHz award consultation document refers to "...the possibility of looking to impose roaming conditions..." and FMS looks forward to this happening. Until then, the innovation spectrum will remain tumbleweed.

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