Organisation (if applicable):

NATS

Additional comments:

NATS welcomes the opportunity to respond to the consultation on Ofcom's Mobile Data Strategy and would be willing to further discuss our comments with Ofcom if that would be helpful.

General comments:

NATS seeks clarity from Ofcom on the status in its considerations of the band 1 300 -1 350 MHz. For the most part the consultation document makes reference to consideration of the range 1 350 - 1 518 MHz as being a priority (e.g. paragraph 6.35 et seq.), however the summary in section 6.80 makes reference to the range 1 300 - 1 518 MHz contradicting both summary Table 6 and the earlier parts of the same section. In writing this response NATS has assumed the quoting of 1 300 MHz as the lower edge of this range to be a drafting error noting the above observations and given that the review of bands in section 6 contains no consideration of potential issues in this 50 MHz range. If its inclusion is not a drafting error then NATS would contend that the consultation does not properly consider 1 300 - 1 350 MHz and we reserve our right to make further representations after the closing date of this consultation due to the key role of that band for long range aeronautical primary radar in conjunction with the lower adjacent range 1 250 - 1 300 MHz.

We note that Annex 6 appears to contain a number of errors and omissions, even allowing for the combination of some ranges; were this table to be used as a reference source NATS would suggest that Ofcom should further review the information along the following, non-exhaustive lines: missing bands / incorrectly labelled combined ranges, e.g. 1 300 - 1 350 MHz; the "capacity" in at least one case (960 - 1 215 MHz) exceeds the bandwidth of the range quoted, in others it is lower without explanation; we appreciate that the "current use" column is indicated as being non-exhaustive but there are other important aeronautical radionavigation uses at 960 - 1 215 MHz, while we are not aware that amateur services operate in that band.

Question 1: Have we correctly identified the future characteristics of mobile data demand?:

Question 2: Do you agree that there is a prospect of significant continuing growth in demand for mobile data services?:

Question 3: Have we identified all the challenges in realising future growth in citizen and consumer benefits from use of mobile data services and do you have any comments on the nature or the scale of the challenges we have identified?:

Question 4: Have we correctly identified all the areas where Ofcom has a role in addressing the challenges of growing demand for mobile data services?:

Question 5: Do you agree that the main additional area that our mobile data strategy needs to address is in relation to potential future spectrum options?:

Question 6: Is Ofcom doing all that it needs to do in other areas identified as being relevant to the mobile data challenge?:

Question 7: Do you agree with our high-level assessment of likely technology and topology trends and their implications for future spectrum use? We are particularly interested in views on: a) the potential demand for spectrum above 10 GHz, b) the potential impact of integrating broadcast capability into mobile networks, c) whether the technical and commercial challenges of supporting additional frequency bands in mobile devices drives interest towards bands close in frequency to existing bands, d) the relative importance of large contiguous blocks of spectrum versus aggregation of smaller blocks:

Question 8: Are there any additional technology or topology trends that we need to consider that could have an effect on spectrum use?:

Question 9: Do you agree with the short list of bands we have identified for more detailed consideration?:

In relation to the range 1 300 - 1 350 MHz; no, in NATS' view this should be a low priority that should not appear in the short list of bands for consideration: please see NATS' general comments and our response to question 11.

In relation to the range 2.7 - 2.9 GHz; no, however NATS recognises that this band is the subject of Government consideration within the Public Sector Spectrum Release (PSSR) programme and will support that work where invited to do so; in NATS' view this band should at most be medium priority on the basis of information that is available publicly about the maturity of this work and the reasons set out elsewhere in our response to this consultation.

Question 10: Do you agree with our methodology for prioritising potential bands for mobile data use?:

Question 11: Do you agree with our provisional assessment and the results of our band prioritisation?:

1 350 - 1 518 MHz: Noting the clarification requested in the NATS general comments, if the lower edge of this range is indeed 1 350 MHz rather than 1 300 MHz then given experience at 2.6 and 2.7 GHz NATS would suggest that consideration may need to be given to the possibility of adjacent band issues with radar systems operating below 1 350 MHz.

If the lower limit of the range was intended by Ofcom to be shown in the document as 1 300 MHz then NATS disagrees with Ofcom's prioritisation (noting that there is no actual assessment of this 50 MHz range in section 6 of the consultation document) and our opinion is that the range 1 300 - 1 350 MHz should be a low priority not to be considered further, as

per the band 1 215 - 1 300 MHz in Annex 6. From the perspective of long range aeronautical radar the use of the upper 50 MHz of the band below 1 300 MHz is identical to that between 1 300 and 1 350 MHz; assignments in both ranges are used simultaneously in each NATS radar system to achieve the required performance and so in our opinion they cannot be considered separately. This band was not identified in the December 2011 Government update on progress within the PSSR and we also note the CEPT view in relation to this band as seeming not to be suitable for wireless broadband.

2700 - 2900 MHz: NATS has the following comments on the material presented in section 6, which lead us to conclude based upon the methodology and evidence available that we disagree with the provisional assessment and prioritorisation of this band and that it is premature for decisions to be being taken on progressing this band internationally, particularly in the context of WRC-15, until the PSSR work on the band has matured or properly concluded.

The relative downlink capacity of "up to 37" in table 5 is explained in Annex 7 as having been calculated on the basis of up to 50 MHz being available for downlink use. NATS notes the scenarios contained in material proposed by the UK within the ITU-R JTG process (see Attachment 4 to Annex 6 of the Chairman's report of the JTG held in October 2013) that account for up to a 50 MHz guard band between primary radar and mobile systems in this band. We understand this figure to be based upon experience with filter design in the 2.6 GHz radar remediation work and an assumption of band segmentation. We also note that there is no mention of the potential need for such a guard band in this consultation document. As noted elsewhere, the PSSR work has yet to conclude on an amount of spectrum that might be able to be released in this band without impact on the radar systems' ability to meet their operational requirements. NATS expects that any expected benefit figure should both take account of the amount of spectrum that is deemed to not be required for radar use going forwards and any necessary guard band that should be taken out of the amount of spectrum released. According to Table 17 and footnote 62 on page 106 it would appear that the downlink capacity figure in this band was based upon the quoted potentially available figure of 100 MHz split equally between down link and uplink with no consideration of a guard band. In NATS opinion, if the band is being considered for both down and up link then the guard band must be taken into account and assuming a 50 MHz guard band would appear to indicate only 25 MHz being available for downlink, rather than the 50 MHz quoted. NATS believes that the capacity figure in Table 5 would then reduce to "up to 18.5" according to the calculation in Annex 7, which would appear to bring this parameter into the low category comparing it with other entries in this column in Table 5.

NATS disagrees that that the domestic constraints for the realisation of mobile data benefits in the 2700 - 2900 MHz band should be noted as being Low in Table 5. In our view, the fact that it is "already being considered by Government release programme" does not, of itself, indicate a low level of constraint as could be inferred given that no other justification is presented. While we have seen indicative timetables of possible dates for changes to existing radar systems in the band these are all reliant on an economically viable outcome of the release programme work in the band, be this a successful re-planning of the current radars, an alternative technology being available, certified and suitable for deployment in the UK operational environment or some combination of these. Little information has been made

available to radar operators as to the progress of the PSSR on particular in relation to indicative costs or potential constraints in this band so where there is evidence that leads to what otherwise might be considered to be a relatively meaningless assertion that "UK costs or constraints might not be exceptionally high" in relation to this band (section 6.79) then NATS would respectfully ask that this evidence be made available to be assessed by the radar community.

Taking the above comments together, NATS is of the opnion that this band should at most be provisionally considered to be a medium priority.

Noting that the consideration of retuning radar systems above 2900 MHz has been quoted in the consultation document in paragraph 6.54, NATS would reiterate here that none of the modern, solid state radar types used in the UK for civil ATC purposes has been designed to operate above 2900 MHz. NATS recognises that this is as much an issue for the PSSR and that it has been indicated that there is a larger number of non-solid state radar systems in use in the UK in this band that are inherently capable of being tuned above 2 900 MHz without significant re-engineering but this is nevertheless a constraint on larger scale band re-planning / segmentation.

NATS also recalls that the alternative technologies mentioned in paragraph 6.54 of the consultation document are being considered as an alternative to primary use in S band, i.e. for airport approach / medium range radar and that they should not automatically be assumed to be appropriate or feasible as alternatives to conventional long range aeronautical primary radar systems of the types currently deployed.

Question 12: Do you agree with the possible timelines we have identified in this section?:

If Ofcom is referring to timelines or capacities such as those in Table 10 and in any other tables / graphs based on an apparent assumption of some portion of 2.7 - 2.9 GHz being available from 2025/2030 then the NATS response to this question is no and we would reserve our position pending the outcome of the PSSR studies and proper consideration of any transition plan that may become necessary depending on the conclusions.

Question 13: Do you have any comments on the capacity implications outlined in this section?:

Please see the NATS response to Q12

Question 14: Do you agree with the next steps we have identified for further domestic work based on the proposed prioritie?:

Please see the NATS response to Q15

Question 15: How do you think we should adjust our support for international harmonisation based on our proposed priorities?:

NATS has already indicated its opposition within Ofcom's WRC-15 preparatory process to 2.7-2.9 GHz being promoted at this stage of the process as a candidate band for Mobile / IMT

due the immature (as we understand it) status of the work planned under the PSSR, as described in section [6.54] of the consultation document. NATS is concerned that a release within the 2.7-2.9 GHz range may become fait accompli - in part through UK support - before the necessary work has been concluded within the PSSR and that, for example, support for an allocation being made at WRC then becomes a driver in the PSSR and not a result of a considered output of the PSSR process. NATS would therefore welcome an assurance that should the conclusion of the PSSR work be unfavourable regarding the release of all or portions of the 2.7-2.9 GHz band then the UK priority and support both domestically and internationally in relation to potential non-radar use of the band will be reduced accordingly. Any allocation made at WRC before studies have been properly completed, thus creating "the option for future harmonised use of the band for mobile data" (paragraph 1.11) would, in NATS opinion lead to significant uncertainty in the radar industry for both suppliers and operators.

Please also see our earlier comments relating to the band 1 300 - 1 350 MHz.

NATS will continue to contribute to the WRC preparatory studies in both ranges within the UK processes.