Representing:

Organisation

Organisation (if applicable):

NATS

What additional details do you want to keep confidential?:

No

If you want part of your response kept confidential, which parts?:

Ofcom may publish a response summary:

Yes

I confirm that I have read the declaration:

Yes

Additional comments:

NATS welcome the opportunity to respond to this consultation. The NATS response is in part influenced by the evidence we have seen of interference being caused to incumbent users of frequency bands into which mobile applications have been introduced on the basis that DSA technologies such as Dynamic Frequency Selection will protect the existing users. NATS has similar concerns at this stage for the use of geolocation databases.

NATS notes the apparent developments in the UK Public Sector spectrum release work and ITU activities in support of WRC-15. NATS has concerns that these spectrum sharing technologies may be implemented in bands used for aviation safety services where they have yet to develop to the extent that their correct operation can be proven to the levels required for Air Navigation Service Providers (ANSPs) to be able to justify to Aviation Regulators the continued safe operation of the incumbent systems whilst meeting the availability, integrity and continuity requirements for the systems along with their operational requirements supporting airspace capacity. NATS would also foresee that access technique implementations, whether via database approaches or spectrum sensing cognitive measures, might potentially need to be certified under such circumstances to similar levels of integrity etc. as the incumbent aviation systems.

Where equipment exists that is capable of operation in a band used for aviation safety purposes, where it cannot be satisfactorily proven that the risk that such equipment may malfunction or be misused is tolerably low then ANSPs have to take this into account in developing safety justifications for the operation of their systems. This will be the case whether or not the radio regulatory solution has been deemed adequate to protect the incumbent service. This may mean that constraints may have to be introduced on airspace capacity to maintain operations at safe levels with the attendant increases in flight delays and

negative impact on the UK GDP, to which aviation contributes £49Bn (according to Oxford Economics).

NATS understands that due to interference being caused their meteorological radar systems at 5 GHz following the introduction of shared spectrum access by licence exempt wireless access type systems, the UK Meteorological Office is having to consider alternative band operations should their current use become unsustainable. Certainly were such an interference scenario to develop in a band used for aviation purposes then, depending on the band in question, alternative band operations may not be feasible in reasonable timescales due to international harmonisation constraints leading to potential long term capacity constraints and economic impact. Even where an alternative band with certified equipment was available this would be an inefficient outcome as the new band would have less optimal characteristics for the operational requirement than that being abandoned.

NATS is aware that the often intermittent nature of these interference events may make positive identification of the interfering source difficult to track down. However, even where enforcement actions have been able, given time and adequate resources, to identify the source of the interference, we note views expressed within CEPT that consider that the meteorological radar interference at 5 GHz is an issue with regulatory conformance or illegal use, rather than a problem with the regulations or standards themselves (see draft ECC Report 192). While this may be considered a "good" radio regulatory solution, from an ANSP's perspective it creates potentially significant problems for the reasons discussed in this response.

Question 1:How is demand for indoor wireless data connection speeds and capacity likely to develop over the next 5?10 years?:

Question 2:How is demand for indoor wireless data connection speeds and capacity likely to develop over the next 5?10 years?:

Question 3:Are there other types of indoor wireless applications will require access to alternative spectrum other than that provided by the licence exempt 2.4 and 5 GHz bands used by Wi-Fi?:

Question 4:What role do you think Wi-Fi will play in providing wireless broadband connectivity outdoors over the coming 5-10 years?:

Question 5:Will the increased deployment of Wi-Fi access points outdoors create a risk of reduced quality of service performance over the longer term and, if so, will approaches to co-ordinate access point performance be able to mitigate this risk?:

Question 6:Will improved approaches to accessing spectrum in licence exempt bands be needed in the longer term to maintain the quality of service achievable for outdoor public mobile broadband and/or M2M services? If so, which approaches are most likely to be adopted and how likely do you think they are to be successful in improving access to spectrum?:

Question 7:Which frequency bands are most likely to be best suited to providing geographical shared access, including via a geolocation database approach, for use by mobile broadband, for example small cells and M2M applications?:

NATS sees difficulties with shared access in any band used for aviation safety of life / flight purposes for the reasons set out in our general comments.

Question 8:Would access to these bands best be realised through licensing or licence exemption?:

While NATS foresees difficulties at this stage with such shared access, should it be granted to mobile type services in bands that are used for services that provide safety of life / flight functions then the shared access must only be on a licensed basis in order to improve the possibility that any interference caused to the aviation services might be resolved quickly. See also our general comments.

Question 9:Do you believe that tiered shared access to a range of spectrum bands has a role in meeting demand for mobile and wireless data and, if so, which applications and devices do you think will be particularly suited to this access model?:

In NATS view this would depend on the band(s) under consideration and on the nature of the incumbent service(s), see also our responses to questions 7 and 8.

Question 10:Do you believe DSA could play an important future role in the future in enabling a better quality of service and low barriers to spectrum access alongside conventional licensed and LE spectrum approaches?:

In NATS view this would depend on the band(s) under consideration and on the nature of the incumbent service(s), see also our responses to questions 7 and 8.

Question 11:What barriers still remain to the realisation of cost-effective sensing appropriate for low-cost consumer devices and what activities are ongoing to try to address them?:

Question 12:Over what timescales could DSA become a mass market proposition?:

Question 13:What role should Ofcom play, if any, to support the development of DSA and relevant technologies?:

It currently appears that bands are being targeted for new mobile applications based largely on the requirements of the sectors seeking spectrum access. NATS therefore suggests that Ofcom should direct industry looking at DSA and relevant technologies towards bands for which there are realistic opportunities for shared access based upon including a full consideration of the requirements of the incumbent users and services. Where DSA and

relevant technologies are being considered to enable sharing in bands where their mis-application may have significant negative effects then in NATS view radio regulators should ensure that the regulations require that the critical elements of the sharing mitigation techniques must be implemented in such a way that they cannot be disabled, e.g. by hard coding in chip sets.

Question 14:Do you have any other views on any of the issues discussed in this consultation?:

See NATS' general comments

Question 15:What are the frequency bands that would be of most value for R&D purposes?:

In NATS' view, R&D involving transmissions (unless it is R&D into radar or aeronautical technologies) should not be carried out in bands within which there are systems providing safety of life / flight functions.

Question 16:What are the potential benefits of using a geolocation database approach for short-term access to spectrum for R&D and how would you see this working from a practical perspective? Are there alternative approaches that could deliver similar benefits?:

Question 17:What characteristics do you view as important to researchers in arrangements to facilitate temporary access to spectrum for research and development purposes?: