

Wembley National Stadium Limited Response to London 2012 Olympic Games and Paralympic Games Draft Spectrum Plan

Question 1: Do you have any comments on the three approaches we have taken to spectrum planning for the London Games?

No comment other than agreement that the use of wireless devices generally used by broadcasters, venue owners, event owners and the general public does generally increase over time.

Question 2: Do you have any comments on the scope for reducing demand by using fibre-wireless networks within venues?

Wembley National Stadium makes use of an extensive fibre network deployed inside the stadium when it was constructed. It is unlikely that significant benefits could be derived from extending this fibre network either inside or immediately outside the stadium at present. The use of wireless cameras in and around the stadium at present is generally dictated by the flexibility and mobility that the broadcasters require for a particular event and in locations (players line-up on pitch for example) that a wired connection is simply not viable.

Question 3: Do you have any comments on the scope for reducing demand by deploying a London-wide cellular receive system?

No comment as this type of network is unlikely to extend to Wembley Stadium

Question 4: Do you have any other comments on the scope for reducing demand by relying more heavily on wired communications?

In our experience wired communications are preferred by broadcasters, photographers etc. inside the stadium, particularly if the sacrifice made to mobility is significantly outweighed by the improved quality, reliability & speed of service the wired facilities provide.

Question 5: Do you have any comments on the scope for maximising supply by using spectrum more efficiently?

We agree with the aspiration advocated here to use spectrum more efficiently. For established venues such as Wembley Stadium, where there are several events each year with 85,000 plus spectators it may be appropriate for a more definitive venue specific spectrum plan to be prepared in advance of the games certainly the majority of challenges that are likely to be faced with the development of a spectrum plan for the games at this venue will be similar to those that are present at a large proportion of the business as usual events. We acknowledge that there can be variables in the period leading up to the final for example (the finalists and therefore the broadcasters from the country's most interested in having a presence there will not be known until a few days before the final) but we believe that the majority of spectrum matters that need to be addressed can be verified in advance. This can include preferred transmitter locations and power outputs so as to minimise the potential for interference. At the same time this will ensure the most efficient use of spectrum because it will be possible to adjust transmit powers downwards to suit the

propagation characteristics of the stadium together with the effective use of wireless systems to meet the needs of the users.

Question 6: Do you have any comments on the scope for maximising supply by reusing spectrum efficiently?

Comments as Question 5

Question 7: Do you have any comments on the scope for maximising supply by using higher-frequency spectrum?

The use of higher frequencies that improve video quality is likely to appeal to broadcasters as it may justify a move away from wired infrastructure in some instances but this is contrary to the points raised in Question 2 above. Clearly a balance is required between the mobility that the higher frequencies may permit and also the ability of existing wired networks to deliver the quality required but a key consideration in this for a venue such as Wembley Stadium is the physical deployment of transmitters inside the stadium space for antenna deployments during events is at a premium and the RF Health & Safety and antenna separation considerations need to be incorporated into an overall plan for deployment so as to minimise the impact all wireless deployments may have on spectators and workers inside the stadium during an event.

Question 8: Would you consider using free-space optics technologies?

Whilst we do not envisage this to be a requirement for stadium operations we would support the use of free-space optics technologies for broadcasters and other parties who may require communications links between the stadium and any facilities they have outside the stadium demise.

Question 9: Do you have any comments on our assumptions?

We would like to see some reference to the need for Ofcom, LOCOG and event owners generally to recognise in these assumptions that venues such as Wembley Stadium, where business as usual events will be taking place immediately before and after the 2012 Games (and test events if appropriate), may require overall set of assumptions to ensure that the existing spectrum used in and around the stadium is not disrupted in any way. These modified assumptions should also reflect the needs of broadcasters and other parties that make use of spectrum on event days in the stadium.

Question 10: Would you be willing to use LOCOG's land-radio network?

The availability of this network inside Wembley Stadium is unknown at the time of writing this response.

Question 11: If not, how would you prefer to receive land-radio services?

Wembley Stadium has its own radio system

Question 12: Would you be willing to use CTCSS tones/DCS codes to allow the same channel to be used for land radio in both the Olympic Park and the River Zone?

Not applicable

Question 13: Do you have any other comments on our assessment and proposals for land radio?

Greater consideration should be given to the existing radio systems the non-guaranteed users rely on for day to day business in venues such as Wembley Stadium. It is essential that any systems deployed for guaranteed users do not interfere with existing systems in any way.

Question 15: Do you have any comments on our assessment and proposals for wireless microphones and IEMs?

From our experience at Wembley Stadium, particularly during large events such as the FA Cup Final, it will be essential that the transmitter position is coordinated with the frequency they are allocated if the potential for interference is to be minimised. The practicalities of achieving this level of coordination in the period leading up to an event are considerable due both to the physical constraints for available positions for transmitters inside the stadium and also the logistics of getting all users of spectrum for events to the stadium in advance of the event commencing. Ofcom may wish to consider having a representative on site on and before an event day to assist with the coordination and to be in a position to make any last minute adjustments to licences that may be required to improve the use of spectrum during an event.

Question 17: Do you have any comments on ADS?

Ofcom should take into consideration what, if any, ADS frequencies are already in use across existing venues. The use of a different frequency band to that already used inside an existing venue will require, as a minimum, new transmitters and receivers to be procured for that venue. If the ADS frequency can change from venue to venue then Ofcom should state this in the Spectrum Plan for the 2012 Games.

Question 18: Which bands would you prefer to use for wireless cameras?

We would request that any desire to use wireless cameras in the licence exempt band (2.4GHz) is resisted by Ofcom as the proliferation of WLAN type systems in existing venues is already so extensive that the potential for interference from a wireless camera in the licence exempt band is too high.

Question 23: Do you have any other comments on our assessment and proposals for point-to-point links?

We agree with the overall assessment that optical fibre has generally replaced the need for point-to-point links for high speed data links in the majority of venues. We do, however, foresee a potential need for point-to-point links for last minute type situations where the data link between the stadium and an adjacent OB compound for example has been delayed due to way leave type issues and the like.

Question 27: Do you have any comments on our assessment and proposals for telemetry and telecommand?

Our preference is that telemetry and telecommand users are moved away from the licence exempt band (2.4GHz) so as to avoid the potential for interference with WLSN systems that already exist inside existing venues such as Wembley Stadium.

Question 28: Do you have any comments on our assessment and proposals for WLANs?

Wembley Stadium operates an Airspace Management Process which forbids the deployment of any WLSN systems within the Wembley Stadium demise. Event owners are encouraged to make use of the extensive WLAN system that exists inside the stadium and which is managed by the Wembley Stadium IT team. On the rare occasions when this is not possible or feasible, event owners can deploy their own local WLAN system but this is strictly coordinated by the IT team to ensure interference is kept to a minimum.

Question 29: Do you have any comments on our assessment or proposals for spectrum at the six football venues?

We concur with the statement that football venues such as Wembley Stadium are unlikely to have greater spectrum requirements for the 2012 Games than for a large number of business as usual events that take place inside the stadium. The number of PMR channels allocated does appear to be adequate although the full requirements for coverage area and number of users in and around the stadium for The 2012 Games are unknown at present.

The ability for LOCOG to overlay its own PMR network over the existing system at Wembley is also unknown and subject to detailed technical analysis when the requirements become clear. Any comprehensive changes to the radio system at the stadium will need to be planned well in advance (2010) so that any work required on the infrastructure is carried out in the limited windows of opportunity when there are no business as usual events scheduled to take place in the stadium. The consultation document refers to the fact that The Champions League Final is scheduled to take place at Wembley Stadium in May 2011 and we anticipate that the scale of the overall spectrum requirements for an event of this size will dwarf anything seen to date in the stadium - Ofcom may consider this to be a good test situation to verify if the processes and procedures they propose to adopt for spectrum allocation and management at The 2012 Games?

Question 30: Do you have any comments on our assessment and proposals for cultural events?

We concur with the final paragraph where the importance of effective planning by organisations of business as usual events is of paramount importance in the period leading up to The 2012 Games. Wembley Stadium expect to continue to liaise closely with event organisers and encourage them to obtain the correct licences from the relevant party for spectrum that is required for their event in the stadium the need to do this further in advance than perhaps they normally do in the lead up to The 2012 Games is fully understood.

Question 34: Do you agree we should establish special licensing arrangements for users covered by the Government's spectrum guarantees? To what extent is your response based on what has worked well at past Games and comparable events?

Yes . Wembley Stadium agrees with this approach but would request that it is extended to all spectrum users in a venue like Wembley Stadium.

The ultimate aim of the process adopted by Ofcom must surely be to minimise any potential for interference between all spectrum users at any venue and to do this effectively must necessitate the same approach to all spectrum users, not just the guaranteed users.

Question 35: Do you agree that an online application process using the LOCOG rate-card ordering system is the best way for guaranteed users to apply for spectrum licences? How could the licence-application process be made optimal:

We agree with this approach but question why it is limited to guaranteed users only.

Question 36: How can efficient sharing and coordination between Games and non-Games spectrum use best be achieved?

In the period leading up to The 2012 Games (2010 onwards) it may be possible for Ofcom and Wembley Stadium to work together to determine in advance the spectrum needs for the different types of event that are likely to take place in the stadium in the period leading up to The 2012 Games. This will also be true for the period when the Paralympic Games are in progress but business as usual events will be taking place at Wembley Stadium.

By addressing in some detail the typical spectrum requirements for business as usual events in the stadium this far in advance it will allow Ofcom to be confident that the use of spectrum in and around the stadium will be as efficient as possible this may require some detailed propagation analysis in areas of conflict but the end result will be a more thorough understanding of how the various parts of the radio spectrum will interact in and around the stadium when there are circa 90,000 in attendance.

Question 37: How can the use of licence-exempt equipment best be managed?

The use of licence exempt equipment (2.4GHz) is strictly controlled and the deployment of any event specific equipment would be only permitted as a last resort and under the guidance of the Wembley Stadium IT team.

Question 39: How can interference management be most effective in ensuring the successful running of the London Games? Are there other measures we should consider implementing? To what extent is your response based on previous experience of similar events?

Wembley Stadium operates an Airspace Management Process which attempts to reduce the potential for interference to radio systems during events. The priority is always to protect the safety of life systems operating in and around the stadium

whilst at the same time accommodating as much as possible the needs of broadcasters/ concert promoters etc.

In our experience at Wembley Stadium it is essential to have a combination of process (advance booking of spectrum and notification of licence details to venue owner), on site policing (checking licences, transmitter equipment & locations) and the ability to identify quickly the possible source of interference if it does occur (spectrum monitoring).

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