David Hall Systems Ltd

Additional comments:

Question 1: How much do you expect UK mobile data demand to change in the period 2015-2030? Please provide evidence for the trend and, where possible, please indicate how demand might vary across the device categories listed in paragraph 4.7. How should we account for factors (including pricing) that would constrain demand?:

We consider that demand for mobile data will continue to increase though the growth rate is unlikely to be so high as some of the projections forecast. However for various reasons it is difficult to accurately predict what the growth rate will be and accordingly a flexible approach to the provision of spectrum is required.
For the device categories
- Personal mobile devices
We consider the demand for mobile data will increase for this category
- Home and office routers
We consider that there will be little change in data demand for this category
- Portable computing devices
We consider the demand will increase for this category
- Fixed computing devices
We consider that there will be little change in demand for this category and that the proportion of data generated by this category will decrease relative to the others.
- Home and office networking devices
We consider the demand will increase for this category
- Machine to machine communication devices
We consider the demand will increase for this category and this is the category likely to experience the greatest growth. However we expect that a different frequency band will be used for this application compared to the categories listed above.

Question 2: What evidence do you think is relevant to assessing the extent of consumer benefits associated with meeting the increase in demand for mobile data?:

No comment

Question 3: What proportion of mobile data traffic do you expect to be carried over (a) Wi-Fi and similar systems in licence-exempt spectrum and (b) mobile networks in licensed spectrum? How do you expect this to change over the period 2015-2030 and how do you expect total data demand for Wi-Fi and similar systems in licence-exempt spectrum to change over the same period? How might this vary by location, environment etc.?:

We expect that the proportion carried on licence-exempt spectrum will increase over this period. However it is difficult to predict the change in proportions due to the various technology, policy and regulatory developments that are currently taking place/predicted.

Question 4: What factors will act to change the spectral efficiency of mobile technologies in the future? What spectral efficiency values are appropriate for consideration in our study for the period 2015-2030?:

There will be increasing pressure to improve the spectral efficiency of mobile technologies due to the increasing demand for spectrum which will be difficult to meet. Additionally the application of spectrum pricing will act as an incentive to use spectrum efficiently.

Question 5: What service bit rate values are appropriate for consideration in our study for the period 2015-2030? What evidence do you have of changing needs for service bit rates?:

No comment

Question 6: What proportion of traffic do you consider should be assumed to be carried on each cell types for the period 2015-2030? How will this vary with service environment i.e. between home, office, public areas, rural, suburban and urban? What evidence do you have of the factors affecting the uptake of small cells in licensed spectrum in the future?:

No comment

Question 7: Given the current mix of services on cellular networks what is the ratio of downlink to uplink capacity currently dimensioned for and how would you expect this to change over time by 2015, 2020, 2025 and 2030? How do you expect the ratio of downlink to uplink demand to vary for the service categories given in Table A5.4 of Annex 5, and what factors might affect this? How does this ratio of downlink to uplink capacity change (if at all) with network radio access technology and offload to licence-exempt systems?:

With concepts such as cloud computing and user generated content we expect that for most categories of consumer devices the uplink traffic could nearly equal the downlink traffic though for categories such as machine to machine the uplink traffic will be significant but the downlink traffic will be very insignificant. This imbalance in machine to machine traffic could have a significant impact by the end of the study period.

Question 8: What are your views about the pros and cons of the frequency ranges in Table A6.1 in Annex 6 for mobile broadband and for existing applications using this spectrum? Do you have views on other bands that are not in Table A6.1?:

We support the current efforts to clear part of the band 470 - 698 MHz for mobile broadband. Similarly we support the use for mobile broadband of the band 1300 - 1518 MHz excluding the segment 1400 - 1427 MHz. We also support the use of the band 2.7 - 2.9 GHz.
We are opposed to the use of the bands 1518 - 1559 MHz and 1626.5 - 1660.5 MHz for mobile broadband in view of their use for MSS where is a spectrum demand exceeds supply and there are extensive benefits from MSS usage.

We are also opposed to the use of the band 3600 - 4200 MHz for mobile broadband in view of the difficulties in sharing with FSS and this important satellite band that provides significant benefits that cannot be achieved in other bands.
For the other bands mentioned in Table A6.1 we have no strong views.

Question 9: Are there any other bands that are not in Table A6.1 for which you think we should be considering their pros and cons for mobile broadband and for existing applications using this spectrum? :

We are opposed to considering at the bands 1980 - 2010 MHz and 2170 - 2200 MHz. This spectrum could be used for satellite services and there is limited spectrum that could be used. This spectrum is currently under utilized due to the award procedures used and there is a need to avoid this situation with spectrum for mobile broadband

Question 10: What are your views on bands which should be a priority for consideration for mobile broadband?:

We suggest that the band 470 - 698 MHz should be a priority with the band 2.7 - 2.9 GHz a medium term rather than a longer term priority. We consider that there is no urgency for the band 1300 - 1527 MHz excluding the segment 1400 - 1427 MHz to be used for mobile broadband.