

Introduction

CommScope, through its Andrew brand of products is the largest manufacturer of point to point microwave antennas globally. It is an active participant in regulatory bodies and forums worldwide including ETSI (TM4) and Ofcom's own Fixed Wireless Industry Liaison Forum. Through our Comsearch subsidiary, we supply network planning and optimization tools to operators. This combination of antenna design knowledge and the deep understand of link planning has enabled us to carry extensive analysis on the impact of antenna performance in microwave radio networks.

We would like to thank Ofcom for the opportunity to respond to the Initial Consultation on Review of Spectrum Fees for Fixed Links and Satellite Services, published 21 May 2015.

Detailed response to questions raised in the consultation

Question 1 Do you agree with Plum's view of the potential higher value alternative mobile use of the 3.6-3.8 GHz bands over the next seven to ten years?

Response CommScope does agree with Plum's view of the higher value of the use of the 3.6-3.8GHz bands for mobile applications. We would also note that this likely to provide additional capacity in networks rather than broaden coverage. In turn, the additional traffic generated will require to be backhauled from the mobile site to the core network, placing additional demands on the higher frequency microwave bands

Question 2 Do you agree with Plum's analysis of current and future demand for spectrum for fixed links? Please give your reasoning.

Response CommScope broadly agrees that the demand for spectrum is likely to be in bands above 20GHz agree for two reasons. Firstly, there is simply more available spectrum. Secondly, the demand is likely to be for shorter links, either connecting cells within the network itself or back to a fiber access point. These shorter links are better served with higher frequency bands.

We would question the apparent assumption of an inherent preference for fiber over microwave. Whilst this is true over longer distances and very high data rates, over shorter distances the decision becomes down to one of the relative cost of each technology since either can provide the necessary capacity at the required reliability. In addition, the relative benefits of each are continually changing as higher capacity radios become available.

Question 3 Do you agree with Plum's analysis of current and future demand of spectrum for PES and TES? Please give your reasoning.

Response CommScope has no opinion on this question

Question 4 Do you agree with the approach taken by Plum to calculate the opportunity cost of the spectrum? If not, how would you suggest the LCA is calculated? Do you also agree that this methodology is likely to provide a more conservative estimate?

Response CommScope has no opinion on this question

Question 5 Do you agree that Plum has identified the correct options for its LCA analysis? If not, what option(s) do you suggest we consider for the Least Cost Alternative?

Response CommScope has no opinion on this question

Question 6 Do you agree with the cost assumptions that Plum has used in its analysis? Please provide documentary evidence if you disagree.

Response Although CommScope broadly agrees with the cost assumptions used by Plum, we would question the treatment of the 18 GHz band which although counting in the <20GHz model, actually has cost characteristics of the high frequency bands since the majority of deployments are small diameter antennas.

Question 7 Are there any other pieces of publicly available evidence we could use to estimate the opportunity cost of the use of 3.6-3.8 GHz for mobile use now?

Response CommScope has no opinion on this question

Question 8 Do you have any comments on Plum's suggestion to remove the path length factor?

Response CommScope has no opinion on this question

Question 9 Do you have any comments on Plum's suggestion to add a location factor?

Response CommScope has no opinion on this question

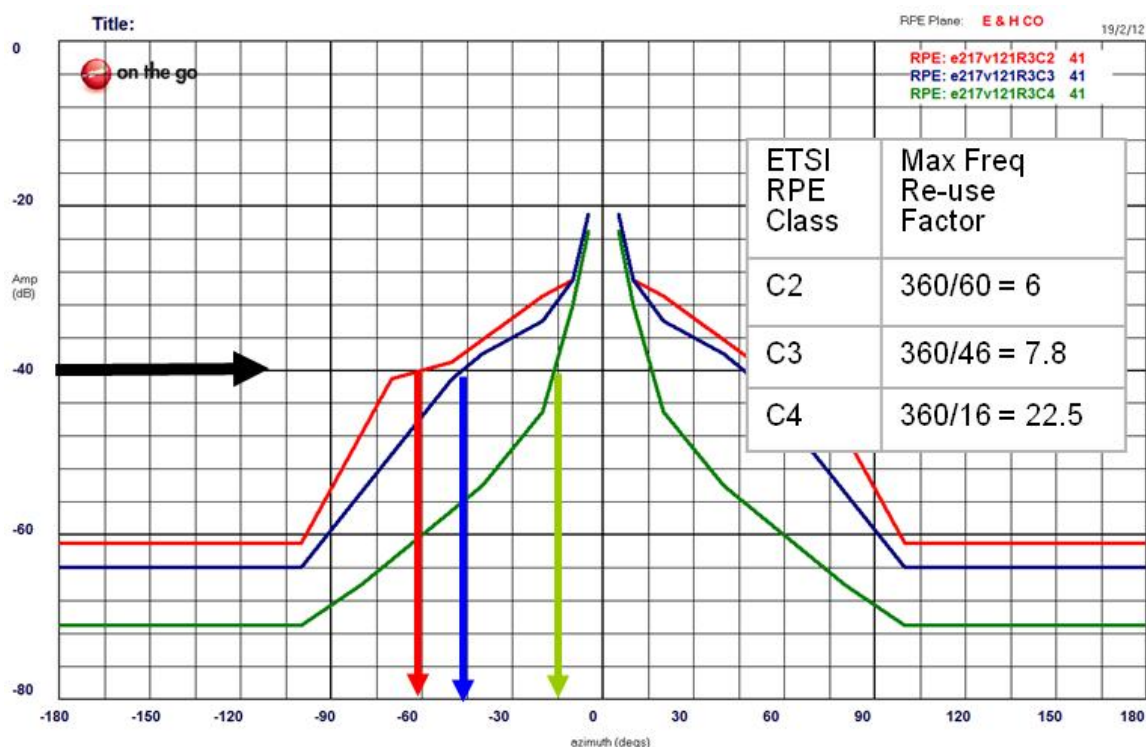
Question 10 What are your views on the need to revise the bandwidth factor in the fixed link algorithm?

Response CommScope has no opinion on this question

Question 11 What are your views on the benefits of additional incentives for the use of high performance antennas? How might these best be implemented in our fees algorithm?

Response CommScope believes that Plum substantially underestimates the potential benefits that can be unlocked by using antennas with the lowest off-axis radiation performance – ie antennas which conform to the ETSI Class 4 pattern envelope masks rather than the current default of Class 3. Our analysis has shown that the potential for spectrum reuse by moving from Class 3 to Class 4 antennas is much greater than the benefits seen many years ago in moving from Class 2 to Class 3.

Considering a simple nodal site, using 0.6m with 40dB attenuation between co-channel hops, 22 Class 4 antennas can be accommodated around 360 degrees but only 7 Class 3 antennas.



Detailed investigation of actual networks indicates that depending on configuration, deploying Class 4 antennas allow 35%-40% more links to be assigned. Alternatively the unused spectrum can be used to allow larger channels, enabling increased link capacities

Incentivizing the use of higher performance (ETSI Class 4 compliant antennas) is therefore in full alignment of Ofcom's objective of incentivizing the efficient use of spectrum (ref section 1.3 of the Consultation).

CommScope would therefore suggest the use of a simple multiplier in the fees factor as follows.

ETSI Antenna Class	Spectrum Efficiency Factor
Class 2	1.3
Class 3	1
Class 4	0.3

All other factors being equal, users of Class 4 antennas would therefore pay approximately a third of the spectrum costs compared to those deploying Class

3 technology. We believe that this should be applied across all frequency bands including those where there are no Class 4 antennas currently available since this will also incentivize equipment manufacturers to develop appropriate products

Question 12 What are your views on the suggestion that we further consider ways to incentivise the use of automatic power control, a suggestion we are minded not to take up?

Response CommScope would point out that if ATPC were deployed, local events, for example, a thunderstorm, could lead to increased off axis radiation impacting on links outside the directly affected area. In turn, this would force an increase in transmit power in these indirectly affected links which would not otherwise be necessary. We would therefore agree with Ofcom's approach not to incentivize the use of ATPC.

Question 13 What are your views on the proposed revisions to the PES algorithm and the TES ratio? In particular, do you agree we should use the relative denial areas to reflect the difference in opportunity cost between PES, TES and fixed links? Do you have any other suggestions for improvement?

Response CommScope has no opinion on this question

Question 14 Do you agree that the benefits of implementing geographic pricing are sufficiently high to warrant us considering this further? Should we look at both where mobile is, and is not, an alternative use? Do you have ideas on how this could be implemented?

Response CommScope has no opinion on this question

Question 15 Do you have any comments to make on any issues related to next steps and implementation?

Response CommScope has no additional comments to make