

Annex 9: The Effects of Redeploying Unused Spectrum

1. As noted in Section 4 of the Response, BTEE and Vodafone hold significant amounts of spectrum that are either completely unused or being used only to a very limited extent. Three has considered what impact it would have if the spectrum were put to better use by being made available to Three and/or O2. This Annex sets out the results of Three's modelling.

Assumptions and Scenarios Modelled

2. In line with the comments made by Ofcom in the Consultation¹, Three has assumed that the following spectrum could be redeployed without needing to move any significant amount of BTEE or Vodafone traffic:

	2.6 GHz unpaired	2.6 GHz paired	Sub-total Per operator (MHz)
BTEE	1x15 MHz	2x30 MHz	75
Vodafone	1x20 MHz	2x20 MHz	60
Total	1x35 MHz	2x50 MHz	135

3. Three has modelled a scenario for a possible redeployment of spectrum where BTEE's and Vodafone's unused spectrum is redeployed, being split approximately equally between Three and O2 as follows:

	2.6 GHz unpaired TDD	2.6 GHz paired FDD	Total per operator (MHz)
Three	1x20 MHz	2x25 MHz	70
O₂	1x15 MHz	2x25 MHz	65
Total	1x35 MHz	2x50 MHz	135

4. The bandwidth of each aggregated component carrier was maximised but it is not always possible to achieve a full 20 MHz carrier bandwidth due to the fragmented composition of the spectrum available.
5. A maximum of five (5) component carriers in carrier aggregation (CA) mode were modelled in line with the current mid-term view of 3GPP standards.

¹ Paragraphs 5.37 and 5.60.

Effects of re-allocation on average download speeds

6. The table below shows the impact on average download speeds if spectrum were reallocated in line with the scenario described above.

Effect on average download speeds if unused spectrum is re-distributed ²	Three	O ₂	VF	BTEE	Mean average operator speed ³
Unused Vodafone and BTEE spectrum divided approximately equally between Three and O ₂	[X]	[X]	0%	0%	[X]

7. [X]-How Three would deploy the unused spectrum.]
8. [X] O2 would derive a larger speed uplift. This is partly due to the fact that O2 has less 4G spectrum today, so any additional re-distributed spectrum is proportionally more beneficial.

² Use of re-distributed spectrum is maximised (where possible) and carrier aggregation is used up to a maximum of 5CA.

³ 'Mean average operator speed' is a simplified way of expressing the speed difference if operators' average download speed was harmonised across four players. Subscriber numbers and data load are assumed to be uniform.