

6155 El Camino Real
Carlsbad, CA 92009-1699
Tel: (760) 476-2200
Fax: (760) 929-3941

Spectrum Policy Group
Ofcom
Riverside House
2A Southwark Bridge Road
London SE1 9HA

Please find herein ViaSat's responses to the Ofcom Consultation on Spectrum Fees.

The Consultation raises a number of questions. For those questions where ViaSat has a response, the question is reproduced below, followed by ViaSat's answers as indicated below in **bold** print following each question.

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

ViaSat agrees that demand for broadband services will increase in the future. Even as other broadband providers continue to extend their networks and service offerings in the US, there has been tremendous growth in the number of installed Ka band customer premise VSAT earth stations. While formerly thought to be a service of last resort, the development of High Capacity Satellite (HCS) designs that offer competitive service offerings at comparable prices with terrestrial networks has actually led to a significant installed base of customers even in urban areas.

In addition to the VSATs, which operate under a license exempt regime, each HCS satellite requires a number of gateway earth stations (PES) to provide connectivity to the beams that service the user terminals.

We expect this trend to continue as ViaSat brings online newer generation HCS satellites with even greater performance.

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?

The costs associated with constructing a satellite link and terrestrial link are not directly comparable as there is significant capital and operational costs related to launching the satellite that are not part of the terrestrial link equation.

Also, the "denial area" should not be considered in the same way. A number of terrestrial links being deployed in the same area can result in a denial of new links being deployed in that same area. By contrast, any number of earth stations can be installed in the same area pointing to either the same or a different satellite and operate harmoniously with no denial of service.

When considering the impact of earth stations and fixed links operating near by, the earth station has a smaller footprint and results in a smaller denial area than would another fixed link site. There are several reasons for this, the earth station antenna is pointing up and has less gain toward the horizon, the earth station is typically mounted closer to the ground, and there is more natural shielding of the signal.

Our experience is that a smooth earth diffraction model does not accurately predict the propagation in the Ka band. Instead, it systematically and substantially overstates the predicted propagation. In support of Earth station licensing activities ViaSat has performed a number of on-site measurements as a follow up to computer simulations of the predicted levels from FS links. In every case the actual measured levels were significantly lower than predicted.

Attenuation of signals from trees, buildings, and other structures, appears to have significant impact on the propagation of Ka band signals along the potential interference path between a fixed site and an Earth station. Thus an analysis using actual surface data would yield much more realistic results when calculating “denial area”.

Through the higher performance available of the Ka band HCS satellites, the size of gateway antennas continue to shrink. An essential element of the network is Internet connectivity and accordingly placement of the gateways near high capacity fiber is important, and often the best location is in an urban area. Given the smaller size of modern Ka band gateways, ViaSat believes that siting gateways in urban areas does not present a significant impact to fixed links.

Regarding TES, a new smaller class of SNG (suitable for mounting on Ford Transit Connect class vehicles for example) and suitcase transportable earth stations are now coming on line. These earth stations are being used to cover news, live events, and provide communications in post disaster and emergency situations. Operation of these terminals is not limited to congested areas, but rather could be anywhere where low cost temporary communications is needed.

Generally, with respect to population density, ViaSat’s experience in the US is that Ka band customers are not limited to rural areas and there are many customers in urban areas and even city centers. This is due to the small footprint of the Ka band customer premise equipment and the increasingly competitive service offerings of satellite relative to available terrestrial solutions. In the US, the number of customers in a given area rises in relation to the population density – that is, we have more customers closer to the urban areas than in rural locations.