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May 20, 2016

VIA ELECTRONIC FILING

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street S.W.
Washington D.C. 20554

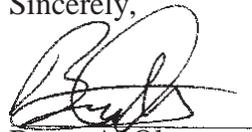
**Re: Oral *Ex Parte* Notice
GN Docket No. 14-177, IB Docket Nos. 15-256 and 97-95;
RM-11664; and WT Docket No. 10-112**

Dear Ms. Dortch:

On May 18, 2016, representatives of The Boeing Company (“Boeing”) met in separate meetings with legal advisors for the FCC Chairman and Commissioners to discuss the above-referenced proceeding and, more specifically, the potential for co-primary spectrum sharing between the proposed Upper Microwave Flexible Use (“UMFU”) service and next-generation broadband satellite communications systems in the 37.5-40.0 GHz band. Participating in the first meeting on behalf of the Chairman’s office were Diane Cornell, Edward “Smitty” Smith, and Amber Lucci. Participating on behalf of the Commissioners’ offices in three subsequent meetings were Johanna Thomas, Daudeline Meme, and Erin McGrath. Participating on behalf of Boeing were Bruce Chesley, Audrey Allison, Mark Neumann, Carlos Nalda, and the undersigned. The discussion tracked closely with the attached talking points and technical slide.

Thank you for your attention to this matter. Please contact the undersigned if you have any questions.

Sincerely,



Bruce A. Olcott

Counsel to The Boeing Company

Attachments

Broadband Satellite Services in the 37/39 GHz Bands

The Boeing Company

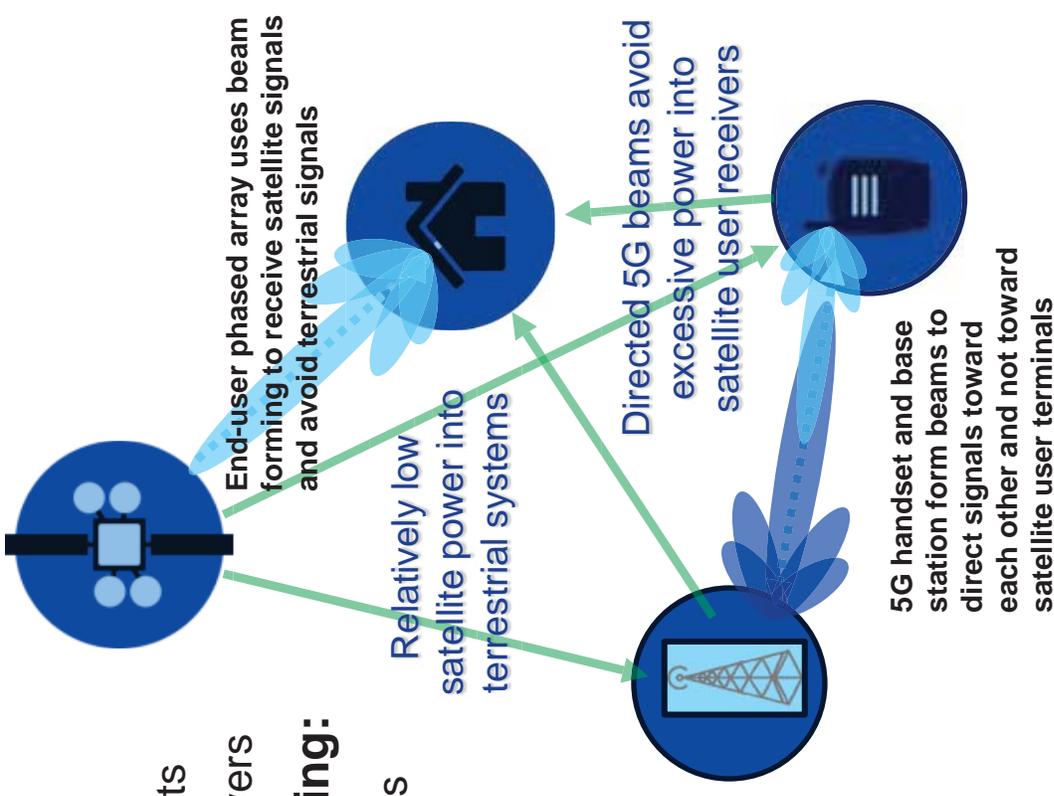
May 2016

- Next-generation satellite systems can provide high capacity broadband service to end-users in *all* locations in the United States and are therefore critical to ensure the universal availability of broadband to all Americans, as required by the Communications Act
 - FCC's 2016 Broadband Progress report indicates insufficient progress is being made to deploy advanced telecommunications services for all Americans
 - FCC should seize opportunity to enable both 5G and nationwide satellite broadband
- Boeing is developing a non-geostationary satellite network that requires access to the entire V-band to provide low latency and very high data-rate broadband services to all locations
 - V-band is the best available spectrum for truly competitive satellite broadband
 - Broadband data usage is asymmetrical – users download far more than upload
 - V-band spectrum was generally balanced between satellite uplink and downlink:
 - 37.5-42.0 GHz (4.5 GHz) for downlink (plus 42.0-42.5 GHz per NPRM)
 - 47.2-50.2 & 50.4-51.4 GHz (4 GHz) for uplink (51.4-52.4 GHz per ITU studies)
 - “Soft segmentation” plan adopted more than a decade ago disrupts balance and FCC consideration of the 37.5-40.0 GHz band for 5G could exacerbate the asymmetry
- The 37.5-40.0 GHz band is a downlink-only band for satellites and satellite end-user receivers may be able to efficiently share the band without adversely affecting 5G operations
 - Advances in satellite and terrestrial antenna technologies and V-band propagation characteristics can enable co-frequency 5G/satellite user terminal operations
 - Adopting reasonable operating provisions (*i.e.*, transmitter height and power limits) consistent with those already identified for 5G would help achieve spectrum sharing
 - Boeing is actively engaged in technical studies and consultations with satellite and 5G proponents to characterize still-conceptual 5G uses and examine sharing potential
 - Industry should be afforded additional time for these important technical discussions
- The FCC should also examine additional bands for 5G deployment, including those shared with satellite uplinks and downlinks, for impact on existing and planned operations
 - A wide range of bands can accommodate and may be better suited for 5G operations
 - The FCC should balance important policy imperatives in this proceeding, including the need to promote universal broadband access and enhance spectrum efficiency
 - The record does not support adopting a spectrum access regime for the 37/39 GHz band at this time but counsels instead toward including this band in a further NPRM

Spectrum Sharing in the 37.5 - 40.0 GHz Band

Boeing Satellite Systems

- **New satellite technologies enable sharing:**
 - Downlink only band for satellite reception
 - Use of high elevation angles to avoid in-line events
 - Narrow beam forming by end-user satellite receivers
- **Satellite measures to ensure efficient sharing:**
 - Remove prohibition on satellite end-user receivers
 - Permit satellite downlinks at ITU PFD levels
- **5G measures to ensure efficient sharing:**
 - Require mobile services to use beam forming
 - Adopt base station transmitter height limit
 - Adopt 5G EIRP limits and power control
 - Require disclosure of base station locations



**Further study and consultation
with wireless industry required**