

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)	
)	
Federal Communications Commission Invites Comment on LightSquared Request to Modify its ATC Authorization)	IB Docket No. 12-340
)	
International Bureau Invites Comment on NTIA Letter Regarding LightSquared Conditional Waiver)	IB Docket No. 11-109
)	
LightSquared Subsidiary LLC Request for Modification of its Ancillary Terrestrial Component Authority)	File No. SAT-MOD-20120928-00160
)	File No. SAT-MOD-20120928-00161
)	File No. SAT-MOD-20101118-00239
)	File No. SES-MOD-20121001-00872
LightSquared Subsidiary LLC Petition for Rulemaking to Allocate the 1675-1680 MHz Band for Terrestrial Mobile Use)	RM-11681
)	
Comments Sought on LightSquared Subsidiary LLC <i>Ex</i> <i>Parte</i> Filing)	WT Docket No. 12-327
)	

REPLY COMMENTS OF THE GPS INNOVATION ALLIANCE

The GPS Innovation Alliance (“GPSIA”) hereby submits these reply comments in response to the initial comments of LightSquared Subsidiary LLC (“LightSquared”) in connection with the Public Notice issued on August 7, 2013,^{1/} seeking comment on an *ex parte* presentation made by LightSquared in the above-referenced proceedings regarding the potential operation of terrestrial wireless handsets in the 1626.5-1660.5 MHz Mobile Satellite Service (“MSS”) band.^{2/} In its comments on LightSquared’s *Ex Parte*, GPSIA expressed its concern that

^{1/} See *Comments Sought on LightSquared Subsidiary LLC Ex Parte Filing*, Public Notice, DA 13-1717 (rel. Aug. 7, 2013) (“*Public Notice*”).

^{2/} See “LightSquared Assessment of Uplinks in the 1626.5-1660.5 MHz Band,” attached to Letter from John P. Janka, Latham & Watkins LLP, Counsel to LightSquared, to Marlene H. Dortch, Secretary, FCC, IB Docket No. 11-109, *et al.* (filed July 15, 2013), as supplemented by letter from Jeffrey J. Carlisle, LightSquared, to Marlene H. Dortch, Secretary, FCC, IB Docket No. 11-109, *et al.* (filed Aug. 7, 2013) (together, “*Ex Parte*”); see also *Comments of LightSquared Inc.*, IB Docket No. 12-340, *et al.* (filed Sept. 5, 2013) (“*LightSquared Comments*”).

LightSquared's analysis is limited and flawed and that the issue of whether, and to what extent, LightSquared's proposed terrestrial handset operations will cause harmful interference to GPS devices should be considered in the context of a transparent public notice-and-comment rulemaking proceeding in which established spectrum protection criteria and all relevant public policy issues can be considered to determine the parameters under which the spectrum can be safely used. LightSquared's Comments provide no information or analysis that resolves the fundamental problems that GPSIA identified in its comments. Accordingly, the Commission should refrain from ruling on LightSquared's application for modification of its authorization to provide MSS at this time and instead consider these issues more broadly in the context of a notice-and-comment rulemaking proceeding with broad public participation.

I. BACKGROUND AND INTRODUCTION

The *Ex Parte* purports to provide technical analyses of the potential interaction of LightSquared terrestrial wireless devices with Global Positioning System ("GPS") units used for general location/navigation, high precision, and aviation services. As GPSIA's initial comments pointed out, the *Ex Parte* did not adequately address the concerns presented by federal agencies, among others, in previous studies related to different types of GPS equipment.^{3/} GPSIA's initial comments also noted the many technical flaws in the *Ex Parte*'s arguments for why handset use in the 1626.5-1660.5 MHz band should be permitted.^{4/} Among other shortcomings, LightSquared continues to treat out-of-band emissions ("OOBE") and overload issues separately, despite the fact that both cumulatively contribute to degradations in signal-to-noise ratio and disrupt GPS reception. LightSquared continues to isolate individual components of its proposed

^{3/} See Comments of the GPS Innovation Alliance, IB Docket No. 12-340, *et al.*, at 9-10 (filed Sept. 6, 2013).

^{4/} See *id.* at 14-22.

operations in a way that purports to demonstrate that they will not degrade GPS reception, without considering the overall impact of its system operations. However, LightSquared's proposed network must be analyzed in its entirety – taking into account the aggregate impact of all of its component parts together – in order to completely and accurately assess its impact on other services. LightSquared has failed to present that overall analysis in the past and the *Ex Parte* similarly lacks a comprehensive analysis, addressing only the impact from select uplink operations.

The LightSquared Comments are intended to address two additional points not raised in the *Ex Parte*. However, as demonstrated below, those two points do not cure the deficiencies in the *Ex Parte*, in particular, or LightSquared's proposal generally. LightSquared claims that its proposal should raise no surprises because it has been in discussions with GPS interests and government representatives about these issues for more than a year.^{5/} LightSquared is correct that members of GPSIA have been in ongoing discussions with LightSquared to determine whether its proposed use of the 1626.5-1660.5 MHz band posed interference risks and fully considered the information provided by LightSquared. The limitations on LightSquared's showings, as described in GPSIA's comments, were fully explored in these discussions, and LightSquared was unable to eliminate these concerns. GPSIA has therefore put these concerns on the record, and these concerns also pertain to issues of strong interest to critical government stakeholders. For the reasons stated in GPSIA's comments, the Commission should refrain from granting the LightSquared application for modification, and, as GPSIA previously pointed out, instead consider the policy issues raised by ubiquitous terrestrial use of any of the L-Band

^{5/} See Paul Kirby, "Handsets, Spectrum Aggregation, LightSquared Relief Discussed at CCA Event," TR DAILY (Sept. 17, 2013).

spectrum covered by LightSquared's evolving requests in the context of a rulemaking proceeding.

II. LIGHTSQUARED'S RELIANCE ON EXISTING HANDSET USE IS MISPLACED

LightSquared asserts that the existence of MSS earth terminals ("METs") and advanced wireless service ("AWS-1") handsets demonstrates that its proposed use of terrestrial handsets in the 1626.5-1660.5 MHz band will not affect GPS.^{6/} However, LightSquared does not address several critical differences between the operation of those devices and its contemplated operations.

LightSquared asserts that because METs operate at higher power and with less restrictive OOB limits, without creating any issues for GPS receivers, terrestrial handsets with lower power and more restrictive OOB limits should be acceptable. However, its argument does not recognize the dissimilar ways in which METs and terrestrial handsets operate. METs are typically used in sparsely populated areas and are, in any case, lightly deployed. METs are also generally installed in controlled environments (*e.g.*, on trucks, ships, etc.) where sufficient isolation between METs and GPS antennas can be ensured. With the dramatic increase in the density of deployment from METs to terrestrial handsets, that isolation can no longer be guaranteed, thereby substantially increasing the likelihood of interference. LightSquared does not account for this difference.

Similarly, the configuration of METs and terrestrial handsets is different. METs use directional antennas. The terrestrial LTE handsets that LightSquared proposes to use employ omnidirectional transmitting antennas which produce radiofrequency energy in a broader area.

^{6/} See LightSquared Comments at 4-7.

Combined with denser deployment, the omnidirectional antennas on LightSquared handsets produce a greater risk of disruption to GPS receivers than do METs.

The technical analyses in the *Ex Parte* do not address the fact that there are other technical standards to which equipment in safety-of-life situations must adhere. To the contrary, the LightSquared Comments claim that METs operating under less restrictive OOB limits have been used in safety-of-life applications in close proximity to GPS antennas without interference. This claim ignores the detailed and specific regulations currently in place that govern the coexistence of METs with GPS receivers used in airborne safety-of-life applications.^{7/} RTCA, Inc.'s DO-210D standard, for example, requires a minimum coupling loss of 40 dB between a satellite transmitter antenna and GPS antenna.^{8/} DO-210D also specifies levels for emissions into Radionavigation Satellite Service ("RNSS") bands that are more stringent than those imposed by the FCC. These METs are permanently affixed to the aircraft and must be installed so that they do not interfere with the intended operation of other required systems on the aircraft, including GPS.^{9/}

Considered together, these requirements prescribe a safe zone – a controlled environment where GPS and METs can coexist on an aircraft. That safe zone is inconsistent with LightSquared's proposal for ubiquitous terrestrial handsets, which will operate in an uncontrolled environment. The Commission must take into consideration these important GPS applications and the additional technical considerations that ensure their availability, integrity, and reliability in safety-of-life applications.

^{7/} See RTCA, Inc., *Minimum Operational Performance Standards (MOPS) for Geosynchronous Orbit Aeronautical Mobile Satellite Services (AMSS) Avionics*, Document No. DO-210D (April 19, 2000).

^{8/} See *id.* at 210.

^{9/} See 14 C.F.R. § 23.1309.

LightSquared also asserts that because GPS does not suffer disruption from AWS-1 operations, it will not be affected by LightSquared's handsets.^{10/} It argues that AWS-1 handsets, among other things, are subject to less restrictive OOB limits than the ones to which it has committed. LightSquared overlooks two critical facts. First, the OOB levels specified in the rules are not likely those at which AWS-1 handsets operate. In addition, the AWS-1 limits are decades old (having been developed in 1981), based on out-of-date engineering assumptions and equipment long out of use. If handsets were to operate at the currently established limits, tests have shown that interference to GPS receivers would certainly occur.^{11/} Based on this data, those limits are not appropriate for the current radiofrequency environment, and should be retired based on government/industry consensus going forward. The fact that AWS-1 handsets may meet an outdated emissions standard cannot justify LightSquared's proposal. Instead, all interested parties, including government agencies, should cooperate to formulate the appropriate engineering criteria that will prevent disruption to GPS reception.

Second, the 1626.5-1660.5 MHz band in which LightSquared's handsets would operate is much closer to the RNSS band than is the AWS-1 spectrum. While GPSIA proposes that all

^{10/} See LightSquared Comments at 6-7.

^{11/} See NASA, *Evaluation of a Mobile Phone for Aircraft GPS Interference* (March 2004), available at http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20040040193_2004035943.pdf (demonstrating that the OOB limits used by AWS-1 are outdated and that devices emitting at those limits will jam GPS). The Executive Steering Group of the Interagency National Executive Committee for Space-Based Positioning, Navigation, and Timing ("EXCOM") has initiated efforts to establish new GPS spectrum interference standards that will help inform future proposals for non-space commercial uses in the bands adjacent to the GPS signals. See Letter from Ashton B. Carter, EXCOM Co-Chair, Deputy Secretary of Defense, and John D. Porcari, EXCOM Co-Chair, Deputy Secretary of Transportation, to the Honorable Lawrence E. Strickling, Assistant Secretary for Communications and Information, U.S. Dep't of Commerce (Jan. 13, 2012), available at <http://www.gps.gov/news/2012/01/lightsquared/2012-01-13-LightSquared-letter-to-NTIA.pdf>; Letter from Lawrence E. Strickling, Assistant Secretary for Communications and Information, U.S. Dep't of Commerce, to the Honorable Julius Genachowski, Chairman, FCC, at 6 (Feb. 14, 2012), available at http://www.ntia.doc.gov/files/ntia/publications/lightsquared_letter_to_chairman_genachowski_-_feb_14_2012.pdf. GPSIA supports these efforts and urges the Commission to consider the results of the EXCOM work in its consideration of whether LightSquared should be permitted to proceed.

interested parties work together in a comprehensive effort to consider, among other things, the effect of spectral distance from the RNSS band in the parameters required to protect GPS, LightSquared mistakenly assumes, contrary to sound engineering, that because operations in the more distant AWS-1 and Personal Communications Service bands have not resulted in more reported disruptions to GPS, its use of the closer 1626.5-1660.5 MHz band will not either.

III. LIGHTSQUARED’S “COMMITMENTS” DO NOT CURE THE FLAWS IN ITS ENGINEERING ANALYSIS

LightSquared’s Comments attempt to assuage concerns about harm to GPS by asserting that LightSquared has agreed to more restrictive OOB from its handsets than “those reflected in the agreement reached between LightSquared and the GPS industry over a decade ago”^{12/} This is not accurate. The 2002 agreement with LightSquared’s predecessor, Mobile Satellite Ventures Subsidiary LLC, stipulated an OOB limit of -95 dBW/MHz five years after its integrated MSS/ATC services commenced. LightSquared is proposing to use this very same limit for an integrated MSS/ATC service proposed eleven years ago, not a more restrictive one for the terrestrial-only broadband service for which it required a waiver of the integrated MSS/ATC requirement.

Furthermore, as the GPS industry has conclusively demonstrated, the MSS/ATC system that was contemplated for use in the MSS L-Band was *ancillary* to satellite use only, with a limited number of devices.^{13/} The presumptions on which the GPS industry’s prior agreements

^{12/} LightSquared Comments at 8.

^{13/} See, e.g., Comments of the Coalition to Save Our GPS, IB Docket No. 12-340, *et al.* (filed Dec. 17, 2012); Letter from James A. Kirkland, Vice President and General Counsel, Trimble Navigation Limited, to Ms. Marlene H. Dortch, Secretary, FCC, IB Docket No. 11-109 and IBFS File No. SAT-MOD-20101118-00239 (filed Oct. 11, 2012); Reply Comments of the Coalition to Save Our GPS, IB Docket No. 11-109, IBFS File No. SAT-MOD-20101118-00239, ET Docket No. 10-142 (filed Mar. 30, 2012); Comments of the Coalition to Save Our GPS, IB Docket No. 11-109, IBFS File No. SAT-MOD-20101118-00239, ET Docket No. 10-142 (filed Mar. 16, 2012).

were based no longer exist.^{14/} Yet, LightSquared proposes to continue to rely on that agreement despite its attempt to change the fundamental underlying assumptions. The Commission must not allow LightSquared to impose an agreement reached for one service on a completely different service.^{15/}

IV. CONCLUSION

While GPSIA continues to support promoting expanded wireless broadband services, the record in this proceeding makes clear that LightSquared's proposed use of terrestrial handsets in the 1626.5-1660.5 MHz band is currently incompatible with GPS operations. The analysis in LightSquared's *Ex Parte* to the contrary is flawed, and LightSquared's Comments do not overcome these deficiencies. The Commission should therefore refrain from granting LightSquared's application to proceed with a modified deployment of its terrestrial network and address all of the outstanding issues related to its proposal through a rulemaking proceeding.

^{14/} The GPS industry's expectations were no different than the federal agencies who also rely on GPS. *See Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Bands; Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands*, Report and Order and Notice of Proposed Rulemaking, 18 FCC Rcd 1962 (2003).

^{15/} LightSquared argues that the OOB limits it proposes are the same as those the GPS industry agreed that DISH Network Corporation should use in its terrestrial advanced wireless service spectrum. *See* LightSquared Comments at 8-9. However, as noted above, OOB limits applicable in one band may not be appropriate in another. GPSIA is hopeful that there will be a comprehensive assessment, with all interested parties, to further address those differences.

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