1200 G Street, NW
Suite 500
Washington, DC 20005

P: +1 202-628-6380
W: www.atis.org

October 13, 2015

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

RE: Ex Parte, IB Docket No. 12-340; IBFS File Nos. SAT-MOD-20101118-00239; SAT-MOD-20120928-00160; SAT-MOD-20120928-00161; SES-MOD-20121001-00872

Dear Ms. Dortch:

The Alliance for Telecommunications Industry Solutions (ATIS), on behalf of its Copper/Optical Access, Synchronization and Transport (COAST) Committee, would like to express its concerns regarding the proposed use of certain radio spectrum bands near the GPS bands that could negatively affect GPS signal availability. This signal availability is a prerequisite for the proper functioning of U.S. telecommunications networks, especially for mobile users. Therefore, while the telecommunications industry supports maximizing available bandwidth, it urges the Commission to carefully consider the impact of new systems that could interfere with the important use of GPS by U.S. telecommunications networks.

ATIS is a technology and solutions development organization. COAST, one of ATIS' 15 industry forums, develops standards and technical reports related to telecommunications network technology pertaining to network synchronization interfaces over copper and optical mediums, and hierarchical structures for U.S. telecommunications networks. The COAST Synchronization (COAST SYNC) Subcommittee is responsible for validating the network interface standards developed within COAST, to ensure successful synchronization between carriers. Experts on synchronization have been working together within COAST SYNC for more than 30 years through many changes in technologies with new synchronization requirements.

GPS receivers are essential to the telecom industry: The U.S. telecommunications industry has deployed a large number of GPS receivers and is constantly adding new receivers each year as the network grows, especially in wireless. These GPS receivers, which have a lifetime of more than 15 years, are used for precision timing from fixed locations. Based on industry estimates, less than 5% of these units are used to support optical networks and more than 95% are used to support the fixed infrastructure for wireless (i.e. wireless base stations - CDMA, LTE and E911 augmentation systems). The telecommunications industry is dependent on these receivers for precision time accuracy. The time standard, UTC, can only be widely distributed from GPS with today's technology. There is no other option. In addition, the telecom GPS timing systems are the enabling systems for other systems such as E911 triangulation and AGPS, which are used to find the location of wireless handsets.

The impact of interference to GPS receivers deployed to the telecom industry would be significant: The GPS receivers deployed by the telecommunications industry each support many customers. While the total number of receivers may be lower than in other sectors, the impact of a problem with a telecom receiver has a larger impact because the receiver supports many customers. For instance, a problem with a precision timing GPS receiver located at a wireless base station could impact all wireless handset users that use that base station to connect the handsets to the fixed part of the wireless carrier's network. Considering the Commission's requirements related to network reliability and the provision of E911 positioning services, the correct operation of these GPS receivers is important both to the operation of carriers' networks and to users of voice, data and location services.

Telecom GPS receivers cannot be moved: GPS receivers are co-located at wireless base station sites, which have been chosen carefully. Because telecommunication GPS receivers are at fixed locations, they could be negatively impacted from interference from stronger LTE base stations (which would be fixed as well) on the adjacent spectrum and from mobile LTE handsets (which would have varying impacts depending on the numbers and density of the users).

Adjacent band signals could degrade GPS receiver performance: If strong signals are allowed in bands adjacent to GPS signals, the performance of the GPS receivers used throughout telecommunications networks could be significantly degraded. Because none of the mitigation techniques being proposed to address this issue will help with the specific impacts on precision timing receivers, the result could be a decline in network reliability and resiliency.

Narrow band or sharp cut-off antenna filters degrade precision timing receivers: One proposal to allow strong signals adjacent to the GPS bands is to add a new filter to the antenna, but this proposal is not appropriate for precision timing antennas. The timing requirements for telecommunications have become more stringent over time. The current industry requirement for LTE timing accuracy between base stations is going from 1 μs (microsecond) to 500 ns (nanoseconds) and may be further reduced in the future to 100 ns (nanoseconds); equipment vendor requirements may require even greater accuracy (in the tens of nanoseconds). The RF filtering circuit used in a narrow band or sharp cut-off filtered GPS antenna will have a delay through the antenna that varies more strongly with temperature. While variations of this delay may not affect navigation and position, they would directly impact timing accuracy. The antennas for this application are mounted outside to get the best view of the sky, so these antennas will be exposed to a range of outdoor temperatures that are within the performance of the current wideband antennas, but the more stringent timing requirement may be unachievable with a filtered antenna that is overly narrow or has sharp cut-offs.

Additional study is warranted: ATIS COAST will also be providing its input to the Department of Transportation (DOT) GPS Adjacent-Band Compatibility Assessment as that work progresses. ATIS COAST encourages open testing where the precision timing GPS receiver type is represented and any impact on this specific type of GPS receiver can be measured for timing accuracy versus both industry specifications (i.e. for LTE wireless networks) and Commission requirements (i.e. E911 positioning requirements). ATIS COAST believes the results of the DOT study and any related technical work should be considered before any decision is made to change the use of bands adjacent to GPS signals, to avoid any impact to voice and data services on existing and future networks.

The telecommunications industry supports Commission efforts to maximize the bandwidth available for wireless services, but it cannot support these efforts at the expense of degrading existing network operations. Given the critical nature of communications networks and the support that these networks provide for other critical infrastructure services, ATIS COAST believes that it is crucial to consider how signals in adjacent bands may impact this sector and recommends that test plans for this complex testing be reviewed by neutral parties.

If there are any questions, please do not hesitate to contact the undersigned.

Sincerely,

Thomas Goode
ATIS, General Counsel

cc: Julius Knapp, Chief, Office of Engineering Technology (OET), Julius.Knapp@FCc.gov
Jessica Almond, Acting Legal Advisor, Engineering and Technology, Wireless, Office of Chairman Wheeler (Jessica.Almond@fcc.gov)
Ken Biholar, ATIS COAST Chair, ken.biholar@alcatel-lucent.com
William Szeto, ATIS COAST Vice Chair, william.szeto@xtera.com
Lee Cosart, ATIS COAST SYNC Chair, lee.cosart@microsemi.com
David Overdorf, ATIS COAST SYNC Vice Chair, do3863@att.com