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GPSIA Participates in Multiple Proceedings Regarding Spectrum Policy and the Compatibility of GPS and Terrestrial Broadband

WASHINGTON – On Friday, Oct. 16, 2015, the GPS Innovation Alliance (GPSIA) submitted two filings regarding federal spectrum policy. Comments were filed in response to a public notice in the U.S. Department of Transportation's (DOT) GPS Adjacent Band Compatibility assessment, and testimony was submitted for the record to a U.S. House Energy and Commerce subcommittee in response to its recent hearing, "Improving Federal Spectrum Systems." Both filings stressed that the "1 dB standard" is the appropriate criterion for testing the compatibility of terrestrial broadband and GPS operations.

The GPS Innovation Alliance has consistently supported the more complete use of underused spectrum where technically feasible. In both filings, GPSIA expressed support for each government entity's ongoing efforts and stressed the importance of protecting GPS, one of the country's most important and ubiquitous national utilities.

Regarding the DOT effort, GPSIA offered suggestions relating to certain aspects of the proceeding and voiced support for the "1 dB standard" in testing – which would determine Adjacent Band Masks based on a measurement of received interference test signal power levels that cause a 1 decibel (dB) degradation in the receiver's Carrier-to-Noise Density Ratio. As outlined in GPSIA's comments, the organization's support for the 1 dB standard is based on its long and well-established history in international and domestic regulatory proceedings and difficulties associated with other standards.

GPSIA wrote: "While DOT has proposed recording other performance metrics, such as loss of signal lock or degradation of pseudo-range or position accuracy, GPSIA believes these are inappropriate metrics for interference assessment since their inherent basis is an interference level that seriously degrades the RNSS spectrum environment and causes significant disruption to GPS receivers."

Degradation of accuracy or otherwise attempting to determine effects on the "user experience" are not practicable interference metrics, and DOT should rely upon the 1 dB protection criteria in derivation of the Adjacent Band Masks. GPS receivers are used in a tremendous range of end user applications beyond simple navigation. It is unclear how it would be possible to determine whether there has been "material degradation" in the functioning of this wide range of GPS applications, much less what constitutes degradation that is "material."

GPSIA also submitted testimony for the record in response to an Oct. 7 hearing by the House Subcommittee on Commerce and Technology, where the potential for repurposing spectrum currently reserved for use by satellite applications for terrestrial broadband was discussed, but without addressing the difficult technical challenges associated with repurposing satellite spectrum.

A key theme raised in the GPSIA testimony is support for allocating similar uses for spectrum in close proximity to each other. Doing so is an approach that is preferable to adopting receiver standards.

GPSIA also explained the unique technical differences between communications and navigation spectrum use.

"A straightforward approach is to minimize the number of dissimilar spectrum applications in close spectral proximity to each other," GPSIA said. "Put another way, similar spectrum uses should be grouped together to the greatest extent possible to minimize the number of band edges or 'border areas' where dissimilar uses in close proximity create serious interference challenges. This approach minimizes the need for the FCC to engage in extensive rule making to balance the interests of dissimilar spectrum uses in every spectrum 'border' area."

GPSIA then noted that "attempts to attribute Global Navigation Satellite System (GNSS) interference issues mainly to poor receiver design are misguided. The FCC has long understood that receivers designed to receive one set of frequencies can be 'overloaded' by transmissions in adjacent frequencies."

In fact, overload interference is not unique to GPS, whose receivers are typically designed to withstand adjacent band transmissions hundreds of millions of times stronger than GPS signals and compare favorably to other common types of mass market receivers.

GPSIA again voiced support for the 1 dB standard for testing, explaining that communications systems operate above the noise floor spectrum while GPS signals are below the thermal noise floor when they are received.

"Because GNSS operates below the noise floor, the most appropriate means by which to assess the potential of new adjacent band systems is whether the new service causes a 1 dB degradation in a receiver's Carrier-to-Noise Ratio." Other interference metrics, the GPSIA explained, "are based on interference levels that seriously degrade the GNSS spectrum environment and will cause devastating disruption to GPS receivers."

"Use of a 1 dB standard is vastly superior to an approach that attempts to assess whether there is 'actual' harm to an incumbent service, which wrongly assumes that you can accurately predict the impact of a new service across a heterogeneous series of devices in adjacent spectrum. Defining harmful interference by reference to a level of degradation to a particular key performance indicator among a limited universe of devices and applications fails to account for and support future innovation, including known and currently unknown applications which could take advantage of ever increasing accuracy of the position, navigation and timing functions of GPS. Use of a defined change in the noise floor (1 dB) provides a readily identifiable and predictable metric that all interested parties can take into account now and in the future."

GPSIA's testimony concluded by urging policy makers to engage in "rational, long term spectrum planning," noting that a focus solely on regulation of receiver characteristics is likely to have limited usefulness and may be inefficient and harmful to continued innovation in affected spectrum uses.

The GPS Innovation Alliance recognizes the ever increasing importance of Global Positioning System (GPS) and other Global Navigation Satellite System (GNSS) technologies to the global economy and infrastructure and is firmly committed to furthering GPS innovation, creativity and entrepreneurship. The GPS Innovation Alliance seeks to protect, promote and enhance the use of GPS. For more information, please visit www.gpsalliance.org.

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