

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

In the Matter of)
)
Office of Engineering and Technology) ET Docket No. 17-215
Announces Technological Advisory Council)
(TAC) Technical Inquiry Into Reforming)
Technical Regulations)

COMMENTS OF THE GPS INNOVATION ALLIANCE

The GPS Innovation Alliance (“GPSIA”)^{1/} submits these comments in response to the Office of Engineering and Technology’s Public Notice seeking comment on behalf of the Technological Advisory Council (“TAC”) on the processes by which Federal Communications Commission (“Commission”) technical regulations are developed.^{2/}

Over the last 30 years, GPS-enabled technology has become a critical and irreplaceable part of our national infrastructure, and it becomes more deeply ingrained every year. In order to ensure that a range of spectrum-based services can co-exist, the Commission’s technical regulations specify important parameters under which transmitters that use frequencies that are co-channel or adjacent to frequencies received by GPS devices are permitted to operate. GPS devices are not transmitters themselves – they receive signals from satellites authorized,

^{1/} GPSIA was formed in February 2013 to protect, promote, and enhance the use of Global Position System (“GPS”) and Global Navigation Satellite System (“GNSS”) technologies. Members and affiliates of GPSIA come from a wide variety of fields and businesses reliant on GPS, including manufacturing, aviation, agriculture, construction, transportation, first responders, surveying, and mapping. GPSIA also includes organizations representing consumers who depend on GPS for boating and other outdoor activities and in their automobiles, smartphones, and tablets.

^{2/} *Office of Engineering and Technology Announces Technological Advisory Council (TAC) Technical Inquiry Into Reforming Technical Regulations*, Public Notice, 32 FCC Rcd. 6672 (2017) (“Public Notice”).

consistent with international rules and treaties, by the National Telecommunications and Information Administration.^{3/} Yet, the continued growth of GPS depends on rigorously developed technical rules for adjacent band transmissions that (i) protect GPS against interference using internationally agreed-upon protection criteria for GNSS receivers operating in RNSS bands^{4/} and (ii) establish a stable and predictable spectrum environment for all stakeholders.

GPSIA acknowledges that technical standards developed by third parties and input from industry stakeholders can be useful in streamlining the regulatory process and addressing technical issues related to introduction of new technologies. When the Commission employs those technical standards, it should ensure that the organization developing them adheres to principles of openness and reasoned decision-making and that the resulting standards are the result of a broad-based, consensus-driven process.

The Commission, guided by its obligations under the Communications Act, takes into consideration a range of policy, international agreement and other concerns that third parties are not well equipped to evaluate. While the use of standards developed by third parties may be a useful tool for the Commission in some circumstances, the TAC should expressly recognize that the Commission must remain the ultimate arbiter of spectrum policy. For example, decisions regarding appropriate protection levels for services must be made by the Commission – and not

^{3/} Characteristics and interference protection criteria for GNSS receivers operating in Radionavigation Satellite Services (“RNSS”) bands, developed over two decades in the International Telecommunications Union Radio Sector (“ITU-R”), are adopted by the ITU in reports. *See, e.g.*, ITU-R M.1902; ITU-R M.1903.

^{4/} *See* Background Paper on Use of a 1-dB Decrease in C/N₀ as GPS Interference Protection Criterion, United States Air Force, at Section 3(b), <https://www.gps.gov/spectrum/ABC/1dB-background-paper.pdf> (last accessed Oct. 30, 2017).

third parties – to ensure that introduction of one technology does not disadvantage others, including existing user bases.

I. THE COMMISSION MUST ESTABLISH CLEAR GUIDELINES FOR ACCEPTING EXTERNALLY DEVELOPED STANDARDS

The Public Notice suggests that future technical rules need not be developed solely by the Commission and states that input from external groups may be a viable alternative way to develop and maintain rules.^{5/} Accordingly, the Public Notice seeks input on the interchange between the Commission’s rulemaking processes and standards bodies, industry consortia, and external multi-stakeholder groups. The Public Notice particularly asks whether regulations should be written by leveraging industry standards and how the regulatory and rulemaking process should be tied to the standards update process.^{6/} It also asks how the Commission can leverage the work of external multi-stakeholder groups to accelerate the introduction of new technologies and services and the development of accompanying service rules.^{7/}

As the Public Notice suggests, one reason to rely on external groups to help develop technical standards is the time involved in completing a rulemaking proceeding. However, while potentially time-consuming, the rulemaking process ensures an open, transparent public forum, giving all interested parties the opportunity to set forth their (possibly competing) views on an open and transparent record. The Administrative Procedure Act (“APA”), which governs the Commission’s rulemaking process, requires that the Commission provide the public an opportunity to participate in the development of regulations by issuing a notice of the proposed

^{5/} See, e.g., Public Notice, 32 FCC Rcd. at 6673.

^{6/} See *id.* at 6674.

^{7/} See *id.*

rules and by taking and considering public comment.^{8/} Moreover, the APA “establishes a scheme of reasoned decisionmaking[.]”^{9/} mandating that the process by which an agency determines which rules to adopt be “logical and rational.”^{10/}

These are critical protections, and third parties that develop standards or other technical parameters that the Commission will consider as inputs must emulate them to the greatest extent possible. Consistent with Commission practice, the entities developing technical standards must exhibit protections equivalent to those provided by the APA, including guidelines for participation and reasoned decision-making.¹¹ For instance, the Commission has supported the development of technical criteria by bodies guided by the American National Standards Institute (“ANSI”)’s accreditation procedures, which include, among others, the following due process requirements for the development of consensus – also an ANSI process obligation:^{12/}

- Openness – Participation must be open to all persons directly and materially affected, without undue financial burdens to participate.
- Lack of Dominance – The development process must not be dominated by any single interest category, individual or organization, which means that no entity has a position of or exercises dominant authority, leadership, or influence by reason of superior leverage,

^{8/} See 5 U.S.C. § 553.

^{9/} *Allentown Mack Sales & Serv. v. NLRB*, 522 U.S. 359, 374 (1998).

^{10/} *Id.*; see also 5 U.S.C. § 706 (setting the standard for judicial review of agency decisions).

¹¹ Open participation and a reasoned process provide a failsafe in the event standards bodies become inappropriately co-opted by private interests or otherwise veer away from important principles of transparent decision-making.

^{12/} See *TiVO Inc.’s Request for Clarification and Waiver of the Audiovisual Output Requirement of Section 76.640(b)(4)(iii)*, Memorandum Opinion and Order, 27 FCC Rcd. 14875 (2012) (“*TiVO MO&O*”) (explaining that standards setting bodies should be guided by ANSI’s principles); *The Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communication Requirements Through the Year 2010*, Report and Order, FCC 01-10 (2001); *2000 Biennial Regulatory Review of Part 68 of the Commission’s Rules and Regulations*, Report and Order, 15 FCC Rcd. 24944, 24955 ¶ 28 (2000) (“*2000 Biennial R&O*”); *Regulatory Policies and International Telecommunications*, Opinion, 2 FCC Rcd. 1022, 1028 ¶ 43 (1986) (“*Regulatory Policies Opinion*”); *Integrated Services Digital Networks (ISDN)*, First Report, 98 F.C.C.2d 249, 280 ¶ 64 (1984) (“*ISDN First Report*”) (stating that it has been the Commission’s position that performance standards may be desirable, but such standards should be non-governmental voluntary ones adopted under organizations that are accredited by ANSI).

strength, or representation to the exclusion of fair and equitable consideration of other viewpoints.

- Balance – Participants from diverse interest categories must be sought.
- Consideration of Views and Objections – Prompt consideration must be given to the written views of all participants.
- Consensus Vote – There must be documented evidence of consensus.
- Appeals – There must be an identifiable, realistic, and readily available appeals mechanism with impartial handling of procedural appeals, including whether there was due process.
- Written Procedures – Methods used for standards development must be embodied in written procedures and available to any interested person.^{13/}

In particular, the ANSI openness and diversity requirements ensure that all relevant stakeholders are *able* to participate in standards development. The Commission should be vigilant that rulemaking authority is not turned over to a body that has fees, restricted membership, restricted access to documents, or other barriers that exclude voices from standards development.^{14/}

Although the Commission does not require that an industry standard be developed by an organization that is accredited by ANSI, the Commission has relied on the work of many organizations that follow ANSI's requirements or use a similar process, such as the Digital

^{13/} See ANSI, *ANSI Essential Requirements: Due Process Requirements for American National Standards*, at 4 (Jan. 2017), https://share.ansi.org/shared%20documents/Standards%20Activities/American%20National%20Standards/Procedures,%20Guides,%20and%20Forms/2017_ANSI_Essential_Requirements.pdf.

^{14/} Technical rules adopted by the Commission and codified in its regulations have the advantage of being publically available to all at no cost. As the TAC explores new methods of developing – and complying with – technical standards that may function as *de facto* rules, it should consider methods of ensuring the wide availability of those standards.

Living Network Alliance;^{15/} the American Society for Testing and Materials;^{16/} and the Public Safety National Coordination Committee and the Telecommunications Industry Association.^{17/}

The Commission has also supported other open consensus frameworks. For instance, the Commission has noted with approval^{18/} the principles and attributes of voluntary standards setting bodies included in Office of Management and Budget (“OMB”) Circular No. A-119.^{19/} For an organization to meet the definition of a voluntary consensus standards body under OMB Circular No. A-119, it must demonstrate: (i) openness – the processes used must be open to interested parties and such parties must be provided with meaningful opportunities to participate in standards development; (ii) balance – no single interest should dominate the decision-making

^{15/} See *TiVO MO&O*, 27 FCC Rcd. at 14878 ¶ 8. See also *Regulatory Policies Opinion*, 2 FCC Rcd. at 1028 ¶ 43; see also *ISDN First Report*, 98 F.C.C.2d at 280 ¶ 64 (stating that it has been the Commission’s position that performance standards may be desirable, but such standards should be non-governmental voluntary ones adopted under organizations that are accredited by ANSI). Recently, the Commission described ANSI’s accreditation procedures as “a benchmark for consensus decision-making[.]” noting that they include both appeal and auditing procedures. See *2000 Biennial R&O*, 15 FCC Rcd. at 24954-55 ¶ 27. ANSI’s process requirements include broad participation, consensus, and appeal rights. *2000 Biennial R&O*, 15 FCC Rcd. at 24955-56 ¶ 29; see also ANSI, Domestic Programs (American National Standards) Overview, https://www.ansi.org/standards_activities/domestic_programs/overview?menuid=3 (last visited Oct. 29, 2017).

^{16/} *Amendment of the Commission’s Rules Regarding Dedicated Short-Range Communication Services in the 5.850-5.925 GHz Band (5.9 GHz Band)*, Report and Order, 19 FCC Rcd. 2458, 2468-69 ¶¶ 18-20 (2004) (explaining that it will require all DSRC operations in the 5.9 GHz band to comply with the ASTM-DSRC Standard, which is the product of a “a rigorous and concerted effort, for several years, which involved extensive participation of a broad cross section of the international, scientific, manufacturing, and user communities” and noting that “[c]onsensus was reached amongst these participants who came from diverse interests, technical backgrounds and experiences”).

^{17/} See *The Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communication Requirements Through the Year 2010*, Fifth Memorandum Opinion and Order, Sixth Report and Order and Seventh Notice of Proposed Rulemaking, 20 FCC Rcd. 831 (2005).

^{18/} See *TiVO MO&O*, 27 FCC Rcd. at 14879 ¶ 11.

^{19/} Revision of OMB Circular No. A-119. Office of Mgmt. & Budget, Exec. Office of the President, Circular A-119 Revised, *Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities* (Jan. 22, 2016), effective 81 Fed. Reg. 4673 (Jan. 27, 2016), https://www.nist.gov/sites/default/files/revise_d_circular_a-119_as_of_01-22-2016.pdf.

process; (iii) due process – the policies should be publicly available, there should be adequate notice of meetings and standards development, and conflicts should be resolved using a fair and impartial process; (iv) an appeals process; and (v) consensus – comments and objections are considered using an impartial and transparent process.^{20/} The use of standards bodies that demonstrate these characteristics can help ensure that no industry segment is advantaged at the expense of another and ensure full participation in the development of technical standards.^{21/}

II. THE COMMISSION MUST RETAIN ITS SPECTRUM ARBITRATION FUNCTION

The Public Notice asks whether there are regulations that should be retained because, among other things, they protect incumbents from interference, regulate unlicensed frequencies, or are necessary to comply with international agreements.^{22/} The Communications Act charges the Commission with authority over the nation’s radiofrequency spectrum and determining what radiofrequency regulations best serve the public interest. Regulations that address interference protection, unlicensed frequencies, and compliance with international obligations – highlighted by the Public Notice – are at the core of the Commission’s regulatory obligations, and they must be retained. While the Commission may consider the input of third-party groups and standards-setting organizations, it must not – and indeed may not – abdicate its authority or judgment on these important radiofrequency matters. The Commission itself must consider interference

^{20/} *Id.* § 2e. OMB developed Circular No. A-119 under the guidance of the processes used by ANSI. See *TIVO MO&O*, 27 FCC Rcd. at 14879 ¶ 11 n.38.

^{21/} *Cf.* 2000 Biennial Regulatory Review of Part 68 of the Commission’s Rules and Regulations, Notice of Proposed Rulemaking, 15 FCC Rcd. 10525, 10535 ¶ 25 (2000) (requiring that organizations accredited by ANSI incorporate a balance of industry representatives in order to establish technical criteria).

^{22/} See Public Notice, 32 FCC Rcd. at 6673.

issues because it, rather than external entities, is much better equipped and positioned to make determinations regarding inter-service protection criteria.

Spectrum management is one of the Commission's central functions, requiring that the Commission promulgate rules that ensure the ability of disparate services to co-exist. The Commission is uniquely positioned to take into consideration incumbent rights, the value of unlicensed operations, international matters such as harmonization, and other issues, in order to effectively arbitrate among services to determine appropriate protection levels. Moreover, the Commission has broad statutory obligations to fulfill in pursuit of the public interest,^{23/} and it is therefore more appropriate for the Commission, rather than for third parties, to consider long-term planning and goals for technological advancement and spectrum use, and based on those and other factors, determine the technical rules appropriate for different services. Consequently, it is particularly inappropriate for the Commission to rely on external entities to create inter-service protection criteria. While interference testing and analysis can be performed by third parties based on objective measurements and well-documented procedures, follow-on determinations incorporating public interest considerations can only be reached by the Commission.

For GPS and GNSS in particular, it is critical that the Commission continue to protect receivers from harmful interference. As noted above, GPS-enabled technology has become an irreplaceable part of our national infrastructure, and the tremendous penetration of GPS and GPS-based technologies across diverse industries creates tangible, widespread economic benefits.^{24/} In addition, GPS is essential in numerous applications that ensure safety of life, such

^{23/} See, e.g., 47 U.S.C. §§ 151, 157, 309.

^{24/} One estimate puts the direct economic benefit of commercial GPS technology at \$67.6 billion per year, with eventual indirect annual benefits reaching \$122.4 billion. N.D. Pham, Ph.D, *The Economic*

as aviation navigation. The importance of GPS and GNSS to safety of life, the domestic and global economies, and the daily activities of individuals worldwide, make it critical that these systems be protected from harmful interference in a manner that is universal, predictable, and quantifiable.

Accordingly, as GPSIA and its members have consistently made clear,^{25/} harmful interference affecting GPS and GNSS systems must continue to be evaluated using the metric that the GPS/GNSS industry, the Commission, and the National Telecommunications and Information Administration have used in various contexts for many years – whether there is a 1 dB decrease in the Carrier-to-Noise Power Density Ratio (“C/N₀”).^{26/} Use of measurements of GNSS performance based on user-perception or user-experience – as has been proposed by some^{27/} – would produce results as numerous and varied as the domestic and worldwide uses of GNSS. Evaluating GNSS interference only by reference to such anecdotally-driven standards would not ensure the accuracy, integrity, continuity, and availability of the GNSS signal;

Benefits of Commercial GPS Use in the U.S. and the Costs of Potential Disruption, at 1 (June 2011), http://www.gpsalliance.org/docs/GPS_Report_June_21_2011.pdf. According to another review, this estimate may even be low; it places the value of these benefits at \$68.7 billion, more than likely an underestimate due to data limitations. Irv Leveson, *The Economic Value of GPS: Preliminary Assessment, Presentation to the National Space-Based Positioning, Navigation and Timing Advisory Board Meeting*, at 8 & 15 (June 11, 2015), <http://www.gps.gov/governance/advisory/meetings/2015-06/leveson.pdf>. In fact, GPS is now so ubiquitous that the value of GPS has become as difficult to assess as the value of utilities like telephones and electricity. Greg Milner, PINPOINT 100-101 (W.W. Norton & Co. 2016).

^{25/} See, e.g., Letter from F. Michael Swiek, Executive Director, GPS Innovation Alliance, to Marlene H. Dortch, Secretary, Federal Communications Commission, IB Docket No. 12-340 (filed July 13, 2017); Comments of Trimble Navigation Limited, IB Docket Nos. 11-109 & 12-340 (filed May 23, 2016); Comments of Garmin International, Inc., IB Docket Nos. 11-109 & 12-340 (filed May 23, 2016).

^{26/} For ease of reference, this standard is referred to as the “1 dB standard.”

^{27/} See, e.g., Letter from Gerard J. Waldron, Counsel to Ligado Networks LLC, to Marlene H. Dortch, Secretary, Federal Communications Commission, IB Docket Nos. 11-109 & 12-340 (filed Feb. 24, 2016); Letter from Gerard J. Waldron, Counsel to Ligado Networks LLC, to Marlene H. Dortch, Secretary, Federal Communications Commission, IB Docket Nos. 11-109 & 12-340 (filed June 10, 2016).

moreover failing to gauge GNSS performance based on a universal, quantifiable metric that accounts for all uses and variations in signal would undermine technological innovation by subjecting the design and development of future equipment to tremendous uncertainties about the amount of “noise” present in the radiofrequency environment. The 1 dB standard, in contrast, has allowed GPS to thrive and all GNSS systems to continue to serve a critical role in the continued efficacy of GPS-dependent services and in propelling economic growth.^{28/} The Commission must ensure continued use of this standard in analyzing interference to GPS.

III. CONCLUSIONS

When appropriate, the Commission may consider the use of technical standards developed by external organizations with broad-based, consensus-driven processes, but only after careful vetting of such organizations for transparency and inclusiveness. Decisions regarding appropriate protection levels for services, however, should be made by the Commission – and not third parties – to ensure that competing public interest considerations are evaluated in the manner required by the Communications Act.

Respectfully Submitted,

/s/ Mark Lewellen

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^{28/} “The carrier-to-noise power ratio, C/N_0 , is an important factor in many GPS receiver performance measures. It is computed as the ratio of recovered power, C , (in W) from the desired signal to the noise density N_0 (in W/Hz).” Betz, Hegarty, and Ward, *Satellite Signal Acquisition, Tracking, and Data Demodulation*, in UNDERSTANDING GPS PRINCIPLES AND PRACTICE, 185 (C. Hegarty and E. Kaplan, eds., Artech House 2006).