Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Promoting the Development of Positioning, Navigation, and Timing Technologies and Solutions	)	WT Docket No. 25-110
	)	
	)	

REPLY COMMENTS OF
CONSUMER TECHNOLOGY ASSOCIATION

Consumer Technology Association (CTA)®[1] respectfully submits these reply comments in response to the Federal Communications Commission's (Commission's or FCC's) Notice of Inquiry on Positioning, Navigation, and Timing (PNT) technologies and solutions, which is designed to build a "record on specific actions the Commission can take to incentivize and support industry efforts to develop complementary PNT technologies and solutions for civil use that may be used in conjunction with GPS to form a resilient and secure PNT system of systems."[2] The consumer technology industry recognizes the importance of complementary PNT technologies and encourages the Commission to explore market-driven solutions to advance cost-effective PNT technologies while being mindful of existing users and devices in bands where spectrum-based PNT solutions are deployed.

[1] As North America's largest technology trade association, CTA® is the tech sector. Our members are the world's largest innovators—from startups to global brands—helping support more than 18 million American jobs. CTA owns and produces CES®—the world's most powerful tech event.

[2] *Promoting the Development of Positioning, Navigation, and Timing Technologies and Solutions*, Notice of Inquiry, WT Docket No. 25-110, FCC 25-20 ¶ 3 (rel. Mar. 28, 2025) (*Notice of Inquiry*).

Unless otherwise noted, comments referenced herein were filed in WT Docket No. 25-110 on or about April 28, 2025.

I. INTRODUCTION

CTA supports market-driven innovation and consumer choice and applauds the *Notice of Inquiry*'s focus on supporting industry efforts to develop PNT systems as part of a "whole-of-government" approach to PNT.[3] PNT solutions, most importantly GPS, are critical inputs to consumer technologies that help serve a range of functions from facilitating product delivery to drones operations to syncing across networks to provide voice and data and more.

In addition to leveraging PNT solutions, CTA's members are developing and offering several possible PNT solutions that can support the whole-of-government and system-of-systems approaches to ensuring robust PNT information is available, reliable and usable. Indeed, the record is full of information about promising complementary and augmenting PNT systems.[4] This robust record demonstrates the power of innovation unleashed, especially when government does not mandate technology or otherwise pick winners and losers.

II. GPS RESILIENCY IS CRITICAL, AND CTA SUPPORTS LONGSTANDING EFFORTS TO EXPLORE THE ISSUE

GPS, and location-awareness in general, is central to nearly every aspect of daily life, including for first responders through 911, critical infrastructure, navigating our world, accessing content on our devices, and more. For example, "Americans rely on the Global Positioning System (GPS) when using rideshares, ordering delivery, tending to a farm, or heading out on a hike."[5] In addition to ensuring that GPS is resilient, CTA agrees with other commenters that it is

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[3] *Id*. ¶¶ 3-4.

[4] *See Notice of Inquiry* at n.4 (defining "complementary" PNT to mean the use of technologies or solutions that, together with GPS, provide more accurate PNT data; "alternative" PNT to mean the use of technologies or solutions that would serve as a replacement to GPS in the event of outages or due to limitations of GPS; and "augmentation systems" to mean complementary technologies or systems that enhance GPS data to improve PNT performance metrics overall).

[5] David Grossman and Lisa Dyer, *Don't sacrifice US leadership on GPS to protect against unproven security risks*, Op-Ed, Breaking Defense (May 24, 2024), https://breakingdefense.com/2024/05/dont-

prudent that our nation explores GPS complementary and alternative technologies because "relying on GPS alone as the primary source of PNT data leaves America exposed to a single point of failure and leaves our PNT system open to disruption or manipulation by adversaries."[6]

CTA agrees with both the Commission and many commenters that a whole-of-government approach is appropriate.[7] Several federal agencies, such as the Department of Defense, Department of Homeland Security and Department of Transportation have been studying PNT technologies for many years.[8] CTA encourages the Commission to partner with federal agencies as well as other interested stakeholders that are exploring options to support GPS resiliency and work to identify complementary PNT solutions that are able to demonstrate economic viability and will not interfere with the existing, vibrant consumer technology ecosystem.[9]

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sacrifice-us-leadership-on-gps-to-protect-against-unproven-security-risks (Grossman and Dyer, *Don't sacrifice US leadership on GPS to protect against unproven security risks*).

[6] *Notice of Inquiry* ¶ 2; *see also* Comments of USTelecom – The Broadband Association at 2; Comments of the Wireless Infrastructure Association at 2; Comments of WISPA – The Association for Broadband Without Boundaries at 2 (WISPA Comments).

[7] *See, e.g.*, Comments of the Enterprise Wireless Alliance at 1-2; Comments of The Information Technology Industry Council at 1 (ITI Comments); Comments of the National Telecommunications and Information Administration at 2 (noting that the FCC's proposed whole of government approach "aligns with Executive Branch operations, authorities and initiatives") (NTIA Comments); Comments of the Resilient Navigation and Timing Foundation at 11 (RNTF Comments).

[8] *See, e.g.*, *Notice of Inquiry* ¶¶ 14-15; *Positioning, Navigation, and Timing (PNT) Program*, Department of Homeland Security, Science and Technology, https://www.dhs.gov/science-and-technology/pnt-program (last visited May 9, 2025); *Resilience Through Responsible Use of PNT*, GPS.gov, https://www.gps.gov/-resilience/#federal (last visited May 9, 2025). Some commenters highlighted their testing with government agencies in the record. *See, e.g.*, Comments of Higher Ground, LLC at 1 (Higher Ground Comments); Comments of NextNav Inc. at 5-6 (NextNav Comments); Comments of Tern AI, Inc. at 1 (Tern AI Comments).

[9] *See* Letter from J. David Grossman, CTA, to Marlene H. Dortch, FCC, WT Docket No. 24-240; RM-11989 (Sept 5, 2024) (discussing the potential harm to the Lower 900 MHz Band from NextNav's proposal to fundamentally change the Lower 900 MHz Band service rules and NextNav's licenses in that band) (CTA NextNav Comments).

III. GIVEN THE INNOVATION AROUND PNT, THERE IS NO NEED TO MANDATE TECHNOLOGY OR HARM INCUMBENT SPECTRUM USERS WHEN EXPLORING PNT ALTERNATIVES

CTA is agnostic as to which technology or technologies are used to complement GPS. The record includes a plethora of current and emerging PNT solutions technology, which demonstrates that the Commission need not pick winners or losers or mandate particular technologies. Further, this proceeding presents an opportunity to make common-sense updates to the Commission's rules that can immediately empower Americans to use a variety of systems without generating national security risk.

Commenters highlighted technologies that could provide PNT solutions without harming existing users of the band where their technology operates.[10] These technologies include terrestrial-based,[11] satellite-based,[12] and non-RF-based solutions,[13] each with its benefits and ideal use cases. CTA supports fostering, but not mandating, several solutions because, as the National Telecommunications and Information Administration explains, "[a] diversity of systems

[10] *See generally* ITI Comments at 5 ("Over twenty companies are actively developing terrestrial PNT technologies using existing spectrum or infrastructure….").

[11] *See, e.g.*, Comments of AURA Network Systems, Inc. at 4 (discussing "BPS as a complement to GPS" and eLoran as a "good supplement to GPS"); ITI Comments at 4 (discussing local augmentation systems such as Wi-Fi triangulation and beacon-based networks that offer high-precision PNT in industrial or campus settings); Comments of LoRa Alliance at 2 (explaining that, "[a]lthough not a PNT system by design, LoRaWAN-based networks can support localization"); Comments of Wi-Fi Alliance at 3 ("Based on the current use of this capability in devices, the Commission should consider Wi-Fi CERTIFIED Location™ technologies as part of the suite of technologies and solutions that can supplement GPS.").

[12] *See, e.g.*, Comments of SES Americom, Inc. and O3b Limited at 1-2 (noting that the SES's satellite supplement GPS and Galileo, the European counterpart to GPS); Comments of Xona Space Systems, Inc. at 5 ("The Xona System delivers more precision, power, and protection than GPS using small LEO PNT satellites.").

[13] *See, e.g.*, NTIA Comments at 10 (providing magnetic navigation systems using scalar magnetometers to extract positioning and navigation data as an example of a non-spectrum-based alternative or complement to GPS); Tern AI Comments at 1 (explaining that Tern's Independently Derived Positioning System (IDPS™) requires no spectrum and, instead, "leverages existing onboard vehicle sensor data and intelligent self-healing algorithms to deliver continuous and accurate positioning").

allows for redundancy and greater customization to user needs."[14] Among the innovators discussing new and emerging technologies were several CTA members.[15] A strong set of technologies will facilitate the Commission's system of systems approach and help eliminate the single point of failure risk of GPS.

Given the numerous options available, the Commission should maintain a technology neutral approach to PNT, without imposing tech mandates.[16] Apple correctly notes that the "Commission should avoid creating any de jure or de facto regulatory mandate to implement a particular PNT technology" and that any "rules and policies [should] not unnecessarily constrain the use of particular PNT technologies."[17] CTA agrees with LoRa Alliance that a "technology-neutral stance" can go hand-in-hand with "advocat[ing] for avoiding bands with high existing usage, such as 902–928 MHz, for new PNT system[s] to prevent systemic degradation or switch-off of incumbent networks."[18] When considering emerging PNT solutions, CTA urges the Commission to recognize existing consumer uses in a band and ensure that any benefits derived from enhancements to PNT systems outweigh the costs.[19]

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[14] NTIA Comments at 7.

[15] *See, e.g.*, Comments of Apple Inc. at 6 (discussing how Apple's "Hybridized Emergency Location (HELO) technology makes precise, high-integrity location data available when users make emergency call") (Apple Comments); Higher Ground Comments (discussing its GEOFix™ solution).

[16] *See, e.g.*, Comments of CTIA at 17 ("The Commission should maintain a technology-neutral approach to PNT technology while avoiding regulatory mandates.") (CTIA Comments); Comments of Space Exploration Holdings, LLC at 1-2 ("A broad-based, technology-neutral approach would enhance the security of the PNT ecosystem as a whole by creating a diverse platform on which to create PNT solutions for end users, no matter where they are or how they connect.").

[17] Apple Comments at 1.

[18] LoRa Alliance Comments at 2. Although the *Notice of Inquiry* is "independent of" the NextNav proceeding, *Notice of Inquiry* n.87, CTA observers that NextNav's arguments for the changes it seeks rely heavily on the value its PNT solution can bring. *See generally* Petition for Rulemaking of NextNav Inc., WT Docket No. 24-240 (filed Apr. 16, 2024); NextNav Comments at 18-21.

[19] *See* WISPA Comments at 3 (requesting that the FCC "give special consideration to the disruption to existing services that would be caused by the implementation of any particular PNT technology and solution, including the economic impact of compelling existing spectrum users to replace and/or rebuild

The *Notice of Inquiry* also presents an opportunity to update certain old rules regarding passive receipt of signals from foreign Global Navigation Satellite System (GNSS) constellations. Simply, "[t]he more satellites a receiver can 'receive,' the more accurate the device will be — and accuracy is a critical performance measure separating chipset and receiver brands in a highly competitive field."[20] Expressly enabling "multiple GNSS systems within the United States also makes GPS a less attractive target for adversaries."[21] RNTF observed that "there is substantial evidence to show that reception of non-U.S. GNSS signals, per se, poses very little risk to consumers" in the United States, and the Commission can use its authority to further mitigate any remaining risks of using non-U.S. GNSS signals.[22] Accordingly, CTA agrees that the "Commission should take a hard look at whether its rules concerning foreign GNSS are too restrictive or if they would benefit from clarification."[23]

networks and systems that provide valuable, even essential, benefits and services to the American public, as well as the potential disruption to or even loss of those services themselves") (footnote omitted).

[20] Grossman and Dyer, *Don't sacrifice US leadership on GPS to protect against unproven security risks*.

[21] John Raquet and William Burruss, *More is More: Using Multiple Global Navigational Satellite Systems to Improve Geolocation Accuracy, Performance, and Resilience*, at 35 *attached to* Letter from John Raquet and William Burruss, to Marlene H. Dortch, FCC, WT Docket No. 25-110 (filed Mar. 31, 2025).

[22] RNTF Comments at 4; *see also* CTIA Comments at 10 (observing that "the risk for specific spoofing incidents impacting enterprise and consumer devices in the U.S. remains limited" from foreign-owned and operated GNSS signals).

[23] Comments of the Telecommunications Industry Association at 9; *see also* Comments of the GPS Innovation Alliance at 22 ("[T]he existing regulations concerning access by receive-only earth stations to foreign GNSS constellations are unnecessary and needlessly complex, and they do not reflect existing technologies, or commercial and competitive realities.").

IV. CONCLUSION

PNT technologies are vital to the modern American economy and the consumer technology industry that powers so much of it. CTA applauds the FCC for exploring how the agency can support GPS resiliency, complements and alternatives. CTA requests that the Commission support GPS complements and alternative solutions in a technology-neutral manner and refrain from picking winners and losers, especially those that would cause harmful interference to numerous consumer devices.

Respectfully submitted,

CONSUMER TECHNOLOGY ASSOCIATION

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