

APEX STANDARDS

US FCC Spectrum Reallocation and Public Safety - NextNav's PNT Proposal Under Review

On August 6, 2024, the United States Federal Communications Commission (US FCC) initiated a consultation regarding NextNav's petition to reconfigure the 902-928 MHz band for a 5G terrestrial positioning, navigation, and timing (PNT) network, aimed at complementing and backing up the U.S. Global Positioning System (GPS). This consultation, under Docket 24-240, has attracted significant attention, with over 900 responses submitted from a wide range of stakeholders, including industries reliant on the 902-928 MHz band for critical operations.

NextNav's Proposal and Motivation

NextNav's petition, supplemented on June 7, 2024, seeks to reconfigure the 902-928 MHz band by creating a new "Terrestrial Positioning, Navigation, and Timing Service" (TPNT) to complement GPS. The proposal would allow broader use of the spectrum for mobile and fixed broadband in the 902-907 MHz (uplink) and 918-928 MHz (downlink) bands. NextNav aims to update the multilateration Location and Monitoring Service (M-LMS) rules to eliminate restrictions on one-way operations, the types of data transmitted, and non-emergency interconnection to the public switched network.

The proposed TPNT network would prioritize licensed operations, removing special treatment for unlicensed devices like Part 15 devices, which are widely used in various industries. Additionally, the proposal includes new power and emission regulations to control out-of-band interference, allowing higher power levels in less densely populated areas.

The motivation behind NextNav's proposal is to provide a more reliable, ground-based backup for GPS, which suffers from vulnerabilities such as signal degradation in urban areas and susceptibility to jamming. NextNav also seeks to address the growing demand for 5G services and increased spectrum for supporting applications in transportation, smart cities, utilities, and more.

Impact on Existing IEEE Standards and Technologies

NextNav's proposed reconfiguration could significantly affect devices operating under IEEE standards such as 802.18 (Regulatory), 802.11 (Wi-Fi), 802.15 (Personal Area Networks), and 802.19 (Wireless Coexistence). These standards support a range of devices operating in the 900 MHz band, many of which are integral to smart homes, industrial automation, and healthcare systems. Reallocation of the spectrum could result in interference, affecting the performance of these devices and potentially disrupting operations in sectors such as toll collection, healthcare, and public safety.

Key Concerns from Stakeholders

Spectrum Crowding and Interference:

Numerous stakeholders, including operators of RFID systems and smart building technologies, have raised concerns about spectrum overcrowding. Compressing the remaining users into a smaller portion of the 900 MHz band could lead to significant

interference, particularly for low-power devices under IEEE 802.11 and 802.15 standards. This could disrupt critical services in healthcare, transportation, and home security.

Disruption to Critical Infrastructure:

Several stakeholders, including Texas Instruments and Metro (Los Angeles County), expressed concerns about the disruption to critical infrastructure. The proposal could interfere with energy grid management systems, toll collection services, and transportation tracking networks that rely on the 902-928 MHz band, leading to potential service failures and economic impacts.

Public Safety and First Responders:

While some public safety agencies, like the San Bernardino County Fire Department, supported the proposal for its potential to improve geolocation services for first responders, others raised concerns about interference with existing RFID-enabled tracking systems used in public safety operations. The potential for disrupted communications could compromise emergency response efficiency.

Economic and Operational Impact:

Industries foresee significant financial and operational burdens if forced to transition to different frequencies or redesign existing systems. Cardinal Health, for example, highlighted risks to patient safety due to potential disruption of RFID tracking in healthcare. Meanwhile, agencies like WSDOT and Metro projected high costs for reconfiguring toll collection systems and replacing transponders.

Can Standardization Efforts Balance Innovation and Government Policy in Spectrum Management?

NextNav's proposal offers promising benefits, such as providing a robust backup for GPS and expanding 5G broadband capabilities. However, the potential for significant interference with existing systems—particularly those governed by IEEE standards and used in critical infrastructure—raises considerable concerns. The reallocation of spectrum may impose financial and operational burdens on industries that rely on the 902-928 MHz band, with risks to public safety, healthcare, and industrial automation.

The submission deadline has now closed, but the official reply comment deadline is set for September 20, 2024. It remains to be seen how the discussion will unfold. As the FCC moves forward, it is crucial that standardization efforts balance technological innovation with the need to protect incumbent users, ensuring that industries relying on low-power communication systems are not adversely affected. Furthermore, government and policymaking considerations must guide this process, ensuring that spectrum management serves the broader public interest, fosters economic stability, and supports national security objectives. The success of this rulemaking will depend on navigating these complex intersections of innovation, industry needs, and public safety.

Organization	Key Concern	Potential Impact	Proposed Solution/Action	Key Differences
NextNav	Reconfiguring 900 MHz band for PNT and 5G	Could impact low-power incumbents but supports high-power terrestrial services	Update Part 90 rules for flexible use	Supports new high-power services, focusing on PNT and 5G deployment
ALL-TAG Corporation	Disruption to UHF RFID critical for supply chains	RFID systems in retail, logistics, and healthcare would suffer significant disruptions	Reject petition to protect RFID and supply chains	Prioritizes protecting existing RFID systems crucial for various industries
Security Industry Association (SIA)	Interference with Z-Wave and security systems	Security devices could malfunction, impacting safety	Maintain current spectrum and testing requirements	Focus on security device reliability, public safety impact
Coalition of Industry Organizations (e.g., U.S. Chamber of Commerce, Z-Wave Alliance)	Disruption to industries using Part 15 devices	Municipal, critical infrastructure, and security systems could fail	Reject petition and maintain field testing	Broad opposition across multiple industries concerned about interference
Washington State Department of Transportation (WSDOT)	Interference with tolling systems	RFID tolling systems could face interference, leading to operational issues	Reject petition to ensure toll collection reliability	Focus on protecting transportation operations and toll systems
Honda USA	Disruption to keyless entry systems	Interference could disrupt keyless systems, affecting vehicle access	Ensure coexistence or reject petition	Impact on automotive keyless systems specifically affecting Acura vehicles
Texas Instruments (TI)	Disruption to critical infrastructure	Grid infrastructure, security systems, and industrial communication would be jeopardized	Reject petition to protect low-power, long-range systems	Focus on infrastructure and industrial applications relying on the 902-928 MHz band
Continental Automotive	Disruption to vehicle access systems	Keyless entry systems may fail, affecting millions of vehicle users	Consider national impact on vehicle users and reject petition	Focus on vehicle access systems, similar to Honda's concerns
Cardinal Health	Disruption to healthcare RFID systems	RFID tracking of medical products could fail, risking patient safety and supply chains	Reject petition to protect healthcare systems	Emphasis on healthcare and pharmaceutical supply chain safety
EnOcean GmbH	Disruption to smart building solutions	Smart building systems for energy management could fail, causing operational disruptions	Reject petition to prevent failures in smart building systems	Focus on building automation and energy management systems
Metro (Los Angeles County)	Interference with toll collection systems	Toll transactions could fail, resulting in lost revenue and customer issues	Reject petition to avoid toll system disruption	Concerns about toll systems similar to WSDOT's
GPS Innovation Alliance (GPSIA)	Ensuring protection for GPS systems	Potential interference with GPS signals critical for transportation, public safety, and other sectors	Does not endorse or oppose; stress the need to protecting GPS signals from interference	Neutral stance focused on the need to maintain the integrity of GPS, while recognizing potential complementary PNT systems
San Bernardino County Fire Protection District	Benefits for first responder geolocation	Improved indoor geolocation can enhance emergency response and situational awareness	Support NextNav's petition for public safety benefits	Only agency supporting NextNav, focusing on benefits for first responders

SUMMARY of company views begins with NextNav as the proposer, advocating for the reallocation of spectrum to enable its PNT (Positioning, Navigation, and Timing) network. However, the majority of companies expressed significant concerns about potential interference, operational disruptions, and the costly transitions that could arise from this proposal. Honda USA is open to discussing coexistence solutions, but would reject the proposal if such solutions are not found. The GPS Innovation Alliance (GPSIA) holds a neutral position, acknowledging the importance of enhancing positioning accuracy but also stressing the need to maintain current GPS functionalities. Finally, the San Bernardino Fire Department fully supports the initiative, highlighting the critical benefits of enhanced positioning for improving emergency response and public safety.