

March 10, 2025

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
45 L Street, NE
Washington, D.C. 20054

Re: NextNav Inc. Petition for Rulemaking, WT Docket No. 24-240 & RM-11989.

Dear Ms. Dortch:

The undersigned organizations write to the Federal Communications Commission (“FCC”) expressing opposition to the NextNav Inc. Petition for Rulemaking (“Proposal”).¹ We submit this letter in response to the NextNav’s submission of a report by The Brattle Group (the “Report”) to support the Proposal. NextNav claims the Report demonstrates the multi-billion-dollar value of a terrestrial PNT backup and complement to GPS² by treating the system as an “insurance policy for GPS outages” in the private sector.³ We believe the Report undervalues the risks and overestimates the benefits, while also failing to account for the harms that could be experienced by incumbent users in the band.

We believe the Report has two critical flaws:

1. The Report’s valuation framework omits key facts and relies on assumptions resulting in inaccurate estimates of the potential value created by the Proposal.
2. The valuation framework does not reflect potential harms to incumbent users, which must be central to the Commission’s evaluation of this Proposal and should weigh heavily in a public interest analysis.

I. The Report’s “Insurance Policy” Projection Approach Suffers from Key Flaws

The Report’s analysis leans heavily on aggressive assumptions that provides an incomplete picture about the valuation of NextNav’s proposal. For instance, the Report relies on an analogy to insurance pricing and attempts to calculate the value of the proposal “as an insurance premium to insure the U.S. against the possibility of a GPS outage.”⁴ This suggests that the value represents “the amount one would be willing to pay for a GPS backup system to

¹ See e.g. Comments of the U.S. Chamber of Commerce et al., WT Docket No. 24-240 (filed Sept. 5, 2024) (“Chamber Coalition Comments”); Reply Comments of the U.S. Chamber of Commerce et al., WT Docket No. 24-240 (filed Sept. 22, 2024) (“Chamber Coalition Reply Comments”).

² Notice of Ex Parte of NextNav Inc., WT Docket No. 24-240 at 1 (filed Oct. 21, 2024).

³ Public Benefits of Reconfiguring the Lower 900 MHz Band to Support a Backup and Complement to GPS at 2, attached to id. (the “Report”).

⁴ *Id.* at 10.

avoid the uncertainty and potential losses of GPS disruptions.”⁵ The Report’s calculation of this “premium” depends on several key inputs, including the likelihood that outages of various lengths will occur and the degree of loss likely to result from such outages.

The Report’s estimate of the probabilities associated with GPS outages raises questions. The Report’s focuses on risks of outages created by geo-magnetic storms, which is built around three outage scenarios that it asserts could result from such a storm: a one-day nationwide outage, which it assigns a 28% chance of occurring each year; a seven-day nationwide outage (4% chance per year); and a 30-day nationwide outage (0.7% chance per year).⁶ The Report’s authors anticipate radical changes in space weather over the next decade. Under their analysis, a one-day nationwide GPS outage associated with geo-magnetic storms should occur around once every four years, and a seven-day nationwide outage should occur around once every 25 years. The Report’s assumption means that in the last 25 years the country should have experienced roughly six nationwide GPS outages lasting one day, and likely one seven-day outage. Yet the FCC, which has been keenly aware of the status of GPS issues over the past two decades, has not observed a single one-day nationwide GPS outage and certainly not a seven-day outage during that time span, whether attributable to geo-magnetic storms or not.

The Report’s projections of outage probabilities appear to rely on a single article describing data on geo-magnetic storms collected between the mid-1800s and 2020.⁷ But that article does not discuss GPS or outage probabilities at all. Rather, the 28%, 4%, and 0.7% figures that form the basis of the Report’s valuation model refer in the article to the annualized probability that geo-magnetic storms meeting three arbitrary energy-level cutoffs (“severe,” “great,” and “Carrington event” storms, respectively) will occur.⁸ Neither the Report nor the cited materials explain why a “severe” storm would cause a one-day nationwide outage, a “great” storm would cause a seven-day outage, or a “Carrington event” storm would cause a 30-day outage. Moreover, the Report’s model glosses over the United States’ collective experience with GPS over the past few decades. The cited article suggests that numerous “severe” storms have occurred during GPS’s operational lifespan, yet the Report provides no evidence that these storms resulted in outages. In fact, a May 2024 geo-magnetic storm – the strongest on record since 1989– did not result in a sustained, nationwide GPS outage. Thus, the evidence shows that the lack of disruption during last year’s event raises doubts about the Report’s projected solar impacts.

A critical premise of the Report’s “insurance model” analysis is that NextNav’s technology would be a useful substitute for GPS in the event of an outage. While the Report applies slight reductions to the value of the premium based on the coverage of terrestrial

⁵ *Id.* at 11.

⁶ *Id.* at 19.

⁷ *Id.* at 19-20 (citing S.C. Chapgam, R.B. Horne, and N.W. Watkins, *Using the aa Index Over the Last 14 Solar Cycles to Characterize Extreme Geomagnetic Activity*, 47 *Geophysical Research Letters* (Jan. 22, 2020)).

⁸ S.C. Chapgam, R.B. Horne, and N.W. Watkins, *Using the aa Index Over the Last 14 Solar Cycles to Characterize Extreme Geomagnetic Activity*, 47 *Geophysical Research Letters* (Jan. 22, 2020).

wireless networks and how GPS is used in agriculture,⁹ it does not address other important significant limitations of NextNav’s technology. In its benefits projection, the report critically fails to reflect the “premium” that must be paid by every GPS user to bear the expense of incorporating the NextNav “backup” system across all current GPS devices. Enabling NextNav’s proposed system would not entail just flipping a switch – its functionality must be implemented via software and sometimes hardware in hundreds of millions of devices. Moreover, current GPS devices that cannot communicate over 5G would likely not be able to take advantage of NextNav’s system without expensive retrofits, making widespread adoption challenging.

Finally, the Report’s analysis does not address the economic value of alternative technologies that could provide similar terrestrial PNT capabilities. The FCC record includes several examples of such technologies. The Commission should consider not only the economic value of NextNav’s proposed system but should also compare it against other proposals that offer the same or similar capabilities.¹⁰ It is worth noting in terms of establishing backup GPS, NextNav’s PNT system depends on a 5G network. Stipulating that the Report is correct regarding geomagnetic storm probabilities, these same storms could affect 5G networks. In fact, 5G networks have been impacted by non-geomagnetic power outages in past, and 5G itself relies on GPS for time synchronization.

II. The Report Ignores the Potential Harms Associated with NextNav’s Proposal

As the FCC considers the economic and other impacts of NextNav’s proposal, any purported benefits should be weighed against harms the proposal could inflict on incumbent users of the Lower 900 MHz band. The Report does not consider these substantial and broadly distributed harms associated with NextNav’s proposed reconfiguration of the Lower 900 MHz band. By its own terms, the Report concedes that its analysis “focuses on benefits of reconfiguration” and that such benefits must “be weighed against the costs of the reconfiguration in evaluating the benefits of the proposal to society.”¹¹ These “costs” are central to determining whether NextNav’s proposal is in the public interest.

The Report’s “insurance model” approach to calculating the value of NextNav’s system focuses on the “premium” that GPS users should be willing to pay to avoid losses associated with GPS outages. But to use the insurance framework, one needs to consider all elements of an insurance contract. In a traditional insurance transaction, an insured party pays a monetary premium in return for the legal right to receive compensation in the event of a loss suffered by that party. As noted above, the Report fails to account in its “premium” calculation for the amount that consumers and device manufacturers would have to pay to install NextNav technology in the hundreds of millions of existing and future GPS devices.

¹⁰ See, e.g., Comments of Itron, Inc, at 14-17, WT Docket No. 24-240 (filed Sept. 20, 2024) (collecting and quoting numerous comments describing alternative PNT technologies from parties including the Resilient Navigation and Timing Foundation, Digi, the National Association of Broadcasters, AICC, EFF, and others).

¹¹ Report at 34.

Another major element left out of the cost equation is the harm that consumers could experience in connection with their current devices that rely on the Lower 900 MHz band. That genuine cost must be included in any comprehensive analysis. Current users of the Lower 900 MHz band (including GPS users) would need to contend with interference and channel crowding associated with reconfiguration of the band to serve NextNav's proposal. As the Chamber and other commenters have discussed, NextNav's proposal creates serious risks of catastrophic harmful interference to hundreds of millions of Part 15 and Part 18 devices that currently use the band.¹² These devices include systems used for industrial manufacturing, scientific research, Location and Monitoring Service (LMS), agriculture, security and safety, federal radiolocation, transportation, and critical infrastructure.¹³ Further, the Lower 900 MHz Band is designated for industrial, scientific, and medical applications under the International Radio Regulations, making it exceptionally well-suited for deploying innovative Internet of Things (IoT) use cases on a global scale.¹⁴ This international designation fosters the economies of scope and scale essential for widespread adoption.

Moreover, as the record already demonstrates, implementing NextNav's proposal could disrupt operations of a wide range of devices. Some have projected the potential disruptions could result in *tens or even hundreds of billions of dollars in replacement costs for users* – costs that would largely be borne by consumers.¹⁵ In addition to device replacements, these costs could be reflected in higher prices, tax and toll increases by state and local governments, or rate increases by local utilities.

In our view the Report does not address these costs for a petition and fails to demonstrate a positive cost-benefit analysis.

III. Conclusion

The Report's analysis is unconvincing on its own terms and omits key elements central to the Commission's analysis. In addition to relying on unsupported outage probabilities, the Report does not account for the costs of implementing NextNav's technology in GPS devices, the relative value of alternative terrestrial PNT systems, and – most importantly – the potential damage that NextNav's proposal would inflict on incumbent users of the Lower 900 MHz band. The Report's oversimplified valuation of the protection provided by NextNav's technology fails to account for these vital problems thereby yielding an inflated and one-dimensional account of the NextNav proposal's equities.

¹² See e.g. Chamber Coalition Comments; Chamber Coalition Reply Comments; Notice of Ex Parte of the U.S. Chamber of Commerce et. al., WT Docket No. 24-240 (filed Oct. 18, 2024); Notice of Ex Parte of the U.S. Chamber of Commerce et. al., WT Docket No. 24-240 (filed Oct. 30, 2024). The Chamber's comments and reply comments were joined by more than 70 trade associations and other signatories spanning critical sectors of the U.S. economy.

¹³ See Chamber Coalition Reply Comments.

¹⁴ See 47 C.F.R. § 2.106, n. 5.150

¹⁵ *Id.* at 5; Ex Parte Comments of the LoRa Alliance, WT Docket No. 24-240 (filed Dec. 10, 2024).

Thank you for your consideration of our concerns and we would be happy to discuss in greater detail.

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Airlines for America
Airports Council International – North America
Alarm Industry Communications Committee
American Apparel & Footwear Association
American Gas Association
American Petroleum Institute
American Short Line and Regional Railroad Association
American Trucking Associations
Arizona Trucking Association
Association of American Railroads
Association of Home Appliance Manufacturers
Association for Uncrewed Vehicle Systems International
Builders Hardware Manufacturers Association
Cargo Airline Association
Connected Health Initiative
Connectivity Standards Alliance
Consumer Technology Association (CTA)
Dynamic Spectrum Alliance (DSA)
Edison Electric Institute
Electronic Security Association
EnOcean Alliance
Enterprise Wireless Alliance
Florida Trucking Association
Halloween Industry Association (HIA)
Idaho Trucking Association
Indiana Motor Truck Association
Information Technology Industry Council (ITI)
International Bridge Tunnel and Turnpike Association (IBTTA)
Juvenile Products Manufacturers Association
Kansas Motor Carriers Association
LoRa Alliance
Maryland Motor Truck Association
National Association of Manufacturers
National Electrical Manufacturers Association
National Hydropower Association
National Retail Federation
Nebraska Trucking Association
Nevada Trucking Association
North Carolina Trucking Association

Oklahoma Trucking Association
RAIN Alliance
Retail Industry Leaders Association
Security Industry Association
Software & Information Industry Association (SIIA)
TechNet
Telecommunications Industry Association (TIA)
Tennessee Trucking Association
Texas Trucking Association
The Monitoring Association
The Small UAV Coalition
The Toy Association
Trucking Association of Massachusetts (TAM)
Trucking Association of New York
Utah Trucking Association
Utilities Technology Council
Vertical Aviation International
Washington Trucking Associations
Wi-Fi Alliance
Wi-Sun Alliance
WifiForward
Wisconsin Motor Carriers Association
Wireless Broadband Alliance (WBA)
Wyoming Trucking Association
U.S. Chamber of Commerce
Z-Wave Alliance