United States Senate

COMMITTEE ON
HOMELAND SECURITY AND GOVERNMENTAL AFFAIRS
WASHINGTON, DC 20510–6250

December 18, 2024

The Honorable Alejandro Mayorkas
Secretary
U.S. Department of Homeland Security
Washington, DC 20528

Dear Secretary Mayorkas:

We write to express our concerns regarding the preparedness of critical infrastructure for potential outages of the Global Positioning System (GPS). GPS signals are vital to the operation of critical infrastructure – including in the transportation, energy, telecommunications, and emergency services sectors – but are susceptible to disruptions by foreign adversaries and criminal actors. Public reports of GPS disruptions – including from jamming and spoofing – have increased dramatically; for example, the number of commercial flights globally impacted by GPS spoofing increased from a few dozen in February to more than 1,100 in August.[1] Given this emerging threat, we write to request information regarding the Department of Homeland Security's (DHS) efforts to protect critical infrastructure and public safety from GPS disruptions.

GPS technology has become an integral part of our nation's critical infrastructure. GPS disruptions could affect the delivery of critical community services provided by multiple government and commercial entities, and could lead to cascading detrimental economic, public safety, and security effects. For example, a 2021 report commissioned by the Department of Homeland Security found that foreign adversaries could completely shut down U.S. ports by using a GPS jamming system.[2] One study estimates that a complete GPS outage could cost the U.S. economy $1 billion a day[3].

We are concerned that the United States is lagging in its efforts to prepare for a potential GPS outage when compared to the efforts of our adversaries. Reporting from the New York Times indicates that China is investing in land-based alternatives to GPS, including by building hundreds of physical timing stations and laying thousands of miles of fiber-optic cables.[4] Additionally, both China and Russia have retained and upgraded World War II era technology known called Loran – land-based navigation technology that uses long range radio signals. The United States government, however, appears to have given up efforts to upgrade its own Loran systems.

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[1] Tangel, Andrew, and Drew FitzGerald. 2024. "Fake GPS Signals Fill Cockpits, Adding Risk for Air Travelers." The Wall Street Journal, September 24: A1, A6 .

[2] Mason, Richard, et al. Analyzing a More Resilient National Positioning, Navigation, and Timing Capability. Homeland Security Operational Analysis Center operated by the RAND Corporation, 2021. https://www.rand.org/pubs/research_reports/RR2970.html. Also available in print form.

[3] RTI International. 2019. Economic Benefits of the Global Positioning System. Gaithersburg, MD: National Institute of Standards and Technology. https://www.rti.org/sites/default/files/gps_finalreport.pdf.

[4] Ibid.

We are also concerned by steps that international competitors have taken to challenge U.S. leadership in position, navigation, and timing capabilities. One example is BeiDou, which is China's space-based system of satellites that serves a direct competitor and alternative to GPS. China's BeiDou now has the most satellites of any space-based navigation system, and China has plans to launch even more satellites to support the system by 2035.[5] The National Advisory Board on Space-Based Positioning, Navigation, and Timing – which supports U.S. government work on this matter – has concluded that GPS now significantly lags China's BeiDou in capabilities. The Board argues that "[BeiDou's] enhanced resiliency and capability should be considered an element of "soft power and an element of great power competition."[6] The Board expresses concern that the current capability gap between GPS and other global competitors could seriously threaten U.S. standing as the default provider of Global Navigation Satellite Services.

In light of this emerging threat, we write to request information about the Department's efforts to address GPS vulnerabilities and help enhance the resilience of U.S. critical infrastructure against potential outages and disruptions. Specifically, we request information on the following:

1. Risk Assessments:
   a. What is the Department's current assessment of the risks posed by GPS disruptions and outages to various sectors of critical infrastructure?
   b. How often does the Department conduct or update these risk assessments, and what measures are in place to identify emerging threats?
   c. What steps has the Department taken to collect threat, vulnerability, and consequence data from critical infrastructure sectors to ensure that future risk assessments evaluating GPS disruptions and outages comply with the Department's risk management guidance?

2. Resources:
   a. What resources (financial and personnel) are allocated to GPS resilience efforts within the Department's headquarters staff, within the Cybersecurity and Infrastructure Security Agency, and within other Departmental components?

3. Planning and Preparedness Efforts:
   a. What specific plans and protocols has DHS developed to respond to large-scale GPS disruptions?
   b. How is the Department working with other federal agencies, state and local governments, and private sector partners to enhance resilience in the event of a GPS disruption or outage?
   c. How often has the Department participated in meetings of the National Executive Committee for Space-Based Positioning, Navigation and Timing? Please provide information about who has attended these meetings on the Department's behalf.
   d. What exercises has the Department conducted, sponsored, or participated in that have studied how critical infrastructure operators should prepare for GPS outages?
   e. What, if any, lessons learned from these exercises have been incorporated into guidance that the Department provides to federal and private sector partners, and how the Department would address a disruption in the GPS system?
   f. Is the Department supporting research and development for alternative Position, Navigation, and Timing systems – such as atomic clocks and quantum sensors - and if so, how?
   g. Does the Department track GPS outage incidents across critical infrastructure sectors? If yes, how many outages occurred in FY23 and FY24?

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[5] What if Someone Knocks It Out?" *The New York Times*, March 28. https://www.nytimes.com/2024/03/28/world/asia/as-threats-in-space-mount-us-lags-in-protecting-key-services.html?searchResultPosition=1.
[6] https://www.gps.gov/governance/advisory/recommendations/2024-07-PNTAB-chair-memo.pdf

4. International Considerations:
    a. Does the Department work with any international partners to address risks with the GPS system or other alternate Position, Navigation, and Timing systems?
    b. How has the rise of China's alternative to GPS, known as "BeiDou," impacted the Department's work including the Department's risk assessments of the impact of GPS disruptions to U.S. critical infrastructure?
    c. How do U.S. preparedness efforts for GPS outages compare to the preparedness efforts of other countries including their investments in alternatives to GPS?

As members of the Senate Committee on Homeland Security and Governmental Affairs, we look forward to working collaboratively with DHS to ensure that our communities and the critical infrastructure they rely upon are adequately prepared for GPS disruptions. We request that the appropriate DHS officials brief the Subcommittee on these matters no later than 45 days from the date of this letter.

Thank you for your attention to this important matter. If you have any questions or need additional information, please contact Jillian Joyce at Jillian_Joyce@hsgac.senate.gov and Jacob Stubbs at Jacob_Stubbs@hsgac.senate.gov.

Sincerely,

Margaret Wood Hassan
Chair
Subcommittee on Emerging Threats and Spending Oversight
Committee on Homeland Security and Governmental Affairs

James Lankford
Ranking Member
Subcommittee on Government Operations and Border Management
Committee on Homeland Security and Governmental Affairs