Hearing on

"Where are We? Examining Position, Navigation and Timing Capabilities in the United States"

United States House of Representatives

Committee on Energy and Commerce
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Introduction

Good morning, Chairman Hudson, Ranking Member Matsui and members of the Subcommittee. My name is Sam Matheny, and I serve as Chief Executive Officer of Merkhet Solutions. Prior to my new role leading Merkhet Solutions, I spent 12 years at the National Association of Broadcasters (NAB) as Executive Vice President of Technology and Chief Technology Officer. I am grateful for the opportunity to testify today on the urgent need for resilient alternatives and complements to the Global Positioning System (GPS).

This hearing is particularly timely because just two days ago, Merkhet Solutions launched as an independent company focused on the commercial deployment of the Broadcast Positioning System (BPS™). Launching Merkhet Solutions is a milestone in the development of BPS, as it marks the next chapter in operationalizing this technology for the critical infrastructure stakeholders who need it most.

As I will discuss in more detail today, BPS is a patented terrestrial timing and position technology that leverages the high-power, geographically diverse broadcast infrastructure – using existing broadcast spectrum – already covering the United States. BPS was first conceived by my team at NAB in 2021, and today I am proud and excited to share with the Subcommittee the important national benefits this technology can provide.

Our nation's economy and national security increasingly depend upon precise timing and positioning services delivered by GPS. Yet, the United States has become dangerously overdependent on a single, contested signal from space that remains vulnerable to jamming, spoofing, cyberattacks and natural disruption. These risks endanger virtually every critical infrastructure sector of the national economy, including energy, telecommunications, data centers and financial services, where a disruption to precision time can trigger outages, grid instability and lost trades. A GPS outage would cascade through society at many levels and impact everyday activities, such as the ability to turn on the lights, make phone calls, purchase groceries, withdraw money from an ATM and buy gas at the pump.

BPS has been designed to address this more than $1 billion-per-day economic and national security risk posed by our collective overreliance on GPS, and it does so by using our country's extensive, existing broadcast infrastructure to serve as a reliable, equally effective terrestrial complement to that space-based technology.

What is the Broadcast Positioning System?

The Broadcast Positioning System is a terrestrial complementary PNT system that uses ATSC 3.0 next generation broadcast television signals to deliver precise time and positioning information.

ATSC 3.0 is the latest IP-based broadcast transmission standard that allows broadcasters to deliver advanced video, audio, data and emergency information. It is currently available in 80 markets reaching more than 75 percent of the country. Within this advanced ATSC

3.0 signal, we are able to embed a timestamp, as well as the location of the tower from which it is being transmitted. A single tower transmission can deliver time, and when groups of towers are transmitting BPS, end users can determine location using the exact same triangulation techniques as GPS. In many ways, this is based on the same theory as GPS; however, instead of relying on satellites, this information is communicated through resilient ground-based TV towers. BPS does not require internet, satellite or cellular network connectivity.

Simply put, BPS allows a broadcast television signal to serve two purposes at once: providing a resilient timing and positioning layer for critical users, while delivering enhanced free, over-the-air television to your constituents.

Key Advantages of BPS

GPS is an extraordinary tool and the cornerstone of our national PNT architecture. But it also suffers from a variety of weaknesses and vulnerabilities that threaten our safety and economic well-being. BPS offers a series of advantages over GPS that make it uniquely attractive as a complementary PNT solution.

First, the infrastructure is already in place. America's local broadcasters currently operate transmission facilities, towers and antennas in every corner of the country. Moreover, those facilities are designed to be resilient and redundant. As a result, local broadcasters routinely stay on the air during hurricanes, wildfires, floods, power outages and other emergencies, when all other methods of communication have failed.

Second, BPS is independent of GPS and other global navigation satellite systems. A backup system provides resilience only if it can operate when the primary system is unavailable or compromised. BPS gives critical users a terrestrial option that can function even when GPS is compromised.

Third, BPS is difficult to jam or spoof at scale. GPS signals are weak when received on Earth, which makes local interference relatively easy. In contrast, BPS signals are transmitted terrestrially at high power from tall towers across diverse channels and from geographically diverse locations. That architecture makes widespread disruption substantially more difficult and creates opportunities to detect interference or spoofing by comparing GPS and BPS performance.

Fourth, BPS uses existing licensed spectrum. As this committee knows well, spectrum is scarce, and its allocation complex and controversial. BPS can operate within existing broadcast television spectrum, avoiding the need for any new spectrum allocation.

Fifth, BPS supports unlimited simultaneous users through passive reception. This is essential for emergency and infrastructure applications. The system does not become congested because more people are using the system. A broadcaster can transmit once, and receivers across the coverage area can benefit at the same time.

Finally, BPS can be deployed in phases. Existing ATSC 3.0 stations can be equipped first. Additional markets can be added as ATSC 3.0 deployment expands, while a full

deployment could create a managed, redundant national system across full-power television stations.

BPS Pilot Projects

BPS has been developed in collaboration with the U.S. government and broadcast industry to ensure it can meet the needs of critical infrastructure. The promise of BPS has already moved beyond concept, and a series of federal and private stakeholders have partnered with NAB to pressure-test the technology. NAB demonstrated the first BPS prototype to the U.S. Department of Transportation (DOT) in 2022, followed by the first live broadcast demonstration in 2023. BPS has now been deployed in the Washington, D.C.; Baltimore, Md.; and Denver, Colo., markets for long-term testing and evaluation.

In 2024, NAB entered into a Cooperative Research and Development Agreement (CRADA) with the National Institute of Standards and Technology (NIST), and in 2025, NIST concluded in a peer-reviewed paper that BPS was **"comparable to or better than GNSS"** for time transfer stability and a **"viable complementary PNT solution."**

In August of 2025, DOT awarded NAB a contract to deploy a BPS field trial with critical infrastructure partner Dominion Energy. The safety of our nation's electrical grid provides perhaps the clearest example of why resilient timing matters. Modern power systems depend on accurate time to monitor and manage grid operations. Phasor Measurement Units, often called PMUs, use precise time to measure and align the phase of electrical waves across the grid so that the electricity gets to its intended destination. Other monitoring equipment measurements help operators understand system conditions, detect faults, maintain reliability, and better deploy resources when there is a problem. This field trial is still underway with impressive results seen thus far.

How Congress Can Help

BPS can strengthen national resilience, but speed and scale will require coordinated policy support. Congress can help in three practical ways.

First, Congress should help accelerate BPS installation and operations through funding for traceable time, station hardware, calibration and ongoing network operations and monitoring.

Second, Congress should support and work with the Administration to help designate a lead agency to expedite the activation of BPS and other complements to GPS, as well as facilitate multi-agency coordination.

Finally, Congress should encourage the Federal Communications Commission (FCC) to complete the important work it has already initiated to complete the transition to ATSC 3.0. In addition to the significant benefits to television viewers, including upgraded picture and sound, and more advanced and geographically localized emergency alerting, the full benefits of BPS cannot be harnessed until the FCC completes its work on the ATSC 3.0 transition.

Conclusion

America's dependence on GPS has grown dramatically over the past several decades. At the same time, the risks associated with relying too heavily on a single space-based system have become increasingly clear. The United States needs resilient complementary PNT capabilities that can operate when GPS is disrupted, degraded or unavailable.

The Broadcast Positioning System is poised and ready to meet that challenge. It uses existing broadcast infrastructure. It operates independently of GPS, internet and cellular networks. It can support unlimited simultaneous users. It is difficult to jam or spoof. It has already been tested in multiple markets by expert agencies. And it can be deployed in phases to serve critical infrastructure and the public.

Broadcasters have always served communities in moments of need. Through BPS, that public service can extend to directly protecting the infrastructure that supports the electric grid, telecommunications, transportation, emergency response and national security. Merkhet Solutions was created to help convert that opportunity into reality in the immediate future.

In conclusion, with the right policy support, the United States can rapidly establish a resilient terrestrial complement to GPS.

Thank you again for the opportunity to testify today. I look forward to answering your questions.