

National Security Matters

Providing PNT Resilience:

An Inherently Governmental Responsibility for DHS, DOT, DOC, and DOW

"Inherently governmental" is a term of art in federal law and policy.

The history of U.S. lighthouses offers one of the clearest foundations for what modern law recognizes as an inherently governmental function. From the First Congress onward, maritime aids to navigation were never treated as commercial services; they were understood as core governmental responsibilities.

Historically, positioning and navigation capabilities were developed to meet specific military and sovereign needs rather than to serve as public utilities. The British Admiralty's efforts to determine a ship's longitude at sea led to the development of the marine chronometer. During World War II, the need to guide Allied convoys safely across the Atlantic drove the creation of Loran, a system that soon proved equally valuable for long-range aircraft operating over open ocean and for Allied bombing missions.

The path to GPS as a global capability, alongside earlier systems such as Omega and Transit, followed this same model: Build a system to meet a military requirement, and broader civil uses will follow.

Today, GPS, beyond its military and national security roles, also underpins transportation safety, economic activity, communication networks, precision agriculture, and the operation of critical infrastructure.

In practice, the four government agencies historically responsible for providing PNT services within their domains (with the notable exception of DOT/FAA), no longer operate and provide mission-critical navigation systems for their statutory missions. Instead, they rely on the single, global utility that serves all sectors at once, GPS.

However, the vulnerabilities associated with GPS are no longer theoretical. Intentional jamming, spoofing, and an evolving threat environment to GPS are well-documented.

DOT CPNT Demonstrations

For more than 25 years, the U.S. has struggled to identify a backup to GPS, as directed by multiple

administrations and Congress.

In November 2025, DOT awarded five contracts totaling \$5 million for Complementary Positioning, Navigation, and Timing (CPNT) services under "Rapid Phase II" demonstrations aimed at enhancing PNT resilience beyond GPS.

Rather than pursuing a one-size-fits-all public service, there is merit in identifying and sustaining PNT capabilities aligned to specific user groups and mission requirements, as they were conducted before the adoption of GPS.

OMB Circular A-76 and Commercial Provision

As GPS was evolving into a global utility in the mid-1990s, federal agencies were being challenged by the Office of Management and Budget's (OMB) Circular A-76 (originally issued in 1966). In simple terms, A-76 holds that if the private sector can provide a service, the government should avoid duplicating it.

But GPS created a category that A-76 was not designed to address: The GPS signal is government-owned and government-operated, while the vast majority of receivers, applications, timing systems, and value-added services are commercial/private.

Personal note: From my own Coast Guard experiences, the development and deployment of the Maritime Differential GPS (MDGPS) in the mid-1990s was challenged as competing with commercial differential GPS services that were then being offered as a precise "positioning" aid for offshore oil rigs. The Coast Guard's counter to that challenge was cited under the Coast



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Guard's authority to provide electronic "navigational" aids under Title 14 of the U.S. Code.

Unlike Loran stations or aviation navigational aids such as VOR and ILS, GPS signals originating from space provide no visible physical presence. There are no towers or shore stations to signal that a government system underpins safety of life, national security, and economic prosperity. GPS is simply "there," providing to the user, via privately owned and commercially available user equipment and applications, positioning, navigation, and/or timing information.

The advent of GPS has produced a subtle but important shift in perception: If positioning, navigation, and timing information is delivered by a broad range of commercially produced devices, is the underlying capability that powers those devices still inherently governmental?

As noted, GPS signals are government-owned and operated, but the receivers, timing systems, and related services are overwhelmingly private or commercial, with those served applications now depending on a signal that looks like a commercial utility, but is not.

So that brings us to the dilemma of addressing the question: if today's PNT services are being provided through private/commercial GPS equipment and networks, is the underlying PNT capability, given GPS's vulnerability as a single source, traceable back to being an inherently governmental responsibility when it comes to the identification of a backup?

The postulate proposed here is "yes": Resilient PNT capability is an inherently governmental responsibility, regardless of whether the physical systems are government-operated or commercially provided and contracted by the government.

But the critical problem facing the U.S. over the last 25 years is a reluctance to identify and field backups under existing agency statutes, because GPS has made the decisions for the above-noted government agencies bureaucratically difficult to implement.

Going forward, it is important to note that A-76 does not prevent the government from fulfilling inherently governmental responsibilities, particularly in the service of public safety, communications, and national economic security; it only shapes how such services may be delivered.

In the case of PNT resilience, A-76 is not a barrier if the government's role is understood as ensuring capability rather than necessarily operating it.

DHS and U.S. Coast Guard Responsibilities

The Coast Guard, as part of DHS, provides aids to navigation under long-standing statutory authority and international obligations associated with the Safety of Life at Sea (SOLAS) treaty.

From fixed visual aids to modern electronic aids, these services have always been treated as governmental responsibilities because they protect life, commerce, and sovereign authority over navigable waters.

Although DHS does not operate transportation systems or telecommunications networks, it is charged with protecting critical infrastructure, with PNT already recognized as a cross-sector dependency that underpins multiple sectors of our nation's critical infrastructure.

From a DHS and Coast Guard perspective, ensuring an alternative PNT capability to GPS should be properly characterized as a risk-mitigation responsibility, analogous to providing communications redundancy, e.g., FirstNet.

This responsibility falls directly to the federal government as being inherently governmental because it addresses collective, systemic protection of life, property, commerce, and national security.

DOT and FAA Responsibilities

DOT holds statutory responsibility for the safety and efficiency of the nation's aviation and surface transportation systems. Through the FAA, DOT provides navigation services for aviation where the safety of life is a mandatory require-

ment. Aviation radionavigation aids such as VOR, ILS, and DME are explicitly treated as federal responsibilities because they require uniform standards, reliability, certification, and sovereign accountability.

These navigational aids are treated as federal responsibilities, not because the government must own every component, but because it must guarantee reliability, issue standards, and underscore availability.

Using a similar justification, it can also be argued that the DOT has collective responsibilities for PNT services, enabling the safe and efficient operation of surface road, rail, and pipeline transportation systems serving the nation's economy.

DOC and NIST, Legal Time, and Timing Resilience

Through the National Institute of Standards and Technology (NIST), the Department of Commerce maintains the nation's time and frequency standards. NIST also coordinates and cooperates with the U.S. Naval Observatory (USNO), but the point to be made is that providing legally recognized time is itself a federal responsibility. As such, the two organizations provide the official U.S. precise time contributions to the Bureau International des Poids et Mesures (BIPM), the center in France, which calculates Coordinated Universal Time for the world.

Today, financial markets, telecommunications services, data networks, electric power grids, pipelines, and the Supervisory Control and Data Acquisition (SCADA) services that support them all depend on timing derived from GPS.

Alternative timing sources that preserve national time during GPS disruption align directly with DOC's statutory responsibilities and further reinforce the inherently governmental nature of providing timing backups.

This responsibility does not require DOC to operate every timing source, but it does require the government to ensure that a resilient national timing capability

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that guide our world. Here's a glimpse of what's on the horizon:

- **How USNO Became GPS's Timekeeper:** A look at the quiet rise of the U.S. Naval Observatory as the heartbeat of global timing.
- **Dr. Gladys West's Lasting Legacy:** Revisiting the groundbreaking mathematical work that helped shape modern GPS.
- **Inside the Joint Navigation Conference:** From its origins to its influence today, we'll trace the evolution of this cornerstone event.
- **The NTS1 and NTS2 Breakthroughs:** How two experimental satellites paved the way for the GPS

constellation we rely on now.

- **Inertial Navigation and GPS: A Changing Partnership:** A historical sweep through INS development, the disruption GPS brought, and how the two technologies now strengthen each other.
- **NT in the Kuwait–Iraq War:** A look at how early GPS capabilities shaped operations during the 1990–1991 conflict.
- **The “Lonely Halls” Meeting:** The story behind one of the most pivotal—and least discussed—moments in GPS program history.
- **The Rise of Commercial Vehicle Navigation:** From early prototypes

to today's ubiquitous systems, we'll chart the path of consumer navigation technology.

Stay tuned as we uncover the people, decisions, and innovations that shaped the navigation landscape we depend on every day. 

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exists when GPS is not available.

DOW - GPS as a Sovereign Capability

The DOW developed and deployed, and now operates, sustains, and upgrades GPS as a national defense system with both military and civil services. The decision to provide civil GPS signals free of direct user fees reflects its character as a sovereign capability rooted in national security. Fielded as a dual-use system with civil, commercial, and scientific benefits, its uses have far exceeded expectations, and it is now ubiquitous in daily life.

Today, adversaries target GPS precisely because of its national importance. While DOW is not the appropriate operator of civilian alternative PNT services, its stewardship of GPS underscores a critical point: PNT is not merely a commercial convenience. PNT is a strategic national capability with significant security implications.

This reality strengthens the argument that the obligation for ensuring overall PNT resilience, beyond simply sustaining the GPS space segment, is an inherently governmental responsibility.

Conclusion

The advent of GPS has focused attention on the government's inherently governmental obligation to provide reliable PNT services. Now, growing recognition that our national security relies on such PNT services underscores that the government remains responsible for ensuring resilient PNT capability. This is true whether those services are delivered solely through government systems or through a combination of government and commercial systems contracted by the government.

The practical implication of this conclusion is not that the federal government must build and operate every alternative PNT system itself. Rather, it must recognize that ensuring the existence,

standards, coverage, and reliability of resilient PNT capabilities is itself an inherently governmental obligation.

Under this framework, commercial providers may deliver many of these capabilities, but the government cannot remain a passive consumer. It must actively shape, sustain, and assure these capabilities in the same way it does for aviation navigation, legal time, and maritime aids to navigation.

In this light, DOT's CPNT efforts are not experiments in market adoption but rather early steps toward fulfilling a long-standing governmental responsibility that has been obscured by the success and ubiquity of GPS. 