

Congress of the United States

June 9, 2020

The Honorable Chad F. Wolf
Acting Secretary of Homeland Security
U.S. Department of Homeland Security
Washington, DC 20528

Subject: DHS Report on Positioning, Navigation, and Timing (PNT) Backup and Complementary Capabilities to the Global Positioning System (GPS)

Dear Acting Secretary Wolf,

We write to express our disappointment about the report that was submitted on April 8, 2020. It is unacceptable that the Administration took three years to compile such a brief report that is also over two years late.

Your report fails to address most of the legislative mandates. No information was provided about costs to establish a backup PNT system or systems, the viability of service level agreements, public private partnerships, or schedules, and insufficient information was provided regarding technology options, including terrestrial systems. For example, many of the technologies being examined by the Department of Transportation were not even discussed.

Of the limited information provided, much was incorrect. The enclosed attachment to this letter outlines eleven of the most blatant errors.

Your report also contradicts established Presidential policy. U.S. Space-based Positioning, Navigation and Timing Policy, NSPD-39, clearly mandates federal provision of a GPS backup capability. Further, the President's recent executive order, E.O. 13905, on responsible use of PNT calls for a national research effort on non-space based PNT systems. It also mandates the Department of Commerce make available a "GNSS independent source" of Coordinated Universal Time for all users. Yet your report outlines no approach to achieve this mandate and recommends against the government providing a complementary and backup system despite the overwhelming success of GPS as a publicly provided service.

The report focuses on the needs of "industry" largely ignoring the needs and impact on public services (including first responders), government operations, and individual citizens. These groups must be considered. A discussion of the efficiencies and benefit of the federal government supporting their operations during GPS disruptions should have been included.

Improving the abilities of receivers to resist interference is prominently featured in the report. While this is necessary, it is grossly insufficient. The weak nature of GPS signals means that, regardless of improvements, receivers will always be relatively easy to jam.

The report also ignores the stellar twenty-five year history of GPS as a consummate public good that provides trillions of dollars in benefits each year. A 2012 Boston Consulting Group study estimated the location services enabled by GPS annually drives “\$1.6 trillion in revenues and \$1.4 trillion in cost savings in the U.S. economy.” We note that their analysis did not include the value of the GPS timing services, perhaps the most important use for our economic, and national security.

Any discussion of protecting the nation’s essential GPS and PNT capabilities must include consideration of the small costs of risk mitigation efforts compared to the huge benefits of avoiding economic devastation and the loss of American lives should reliable PNT signals be disrupted or lost, especially for extended periods.

Most of the report’s assumptions and conclusions are incorrect, or at best, unsupported. It is clear that as it was written, the authors of this report had no other goal than to perpetuate an agenda of inattention and neglect of this critical issue.

Please immediately retract this inadequate document and submit a report that is accurate and meets the requirements of the legislation. We expect your new report within 180 days of the date of this letter.

Sincerely,



JOHN GARAMENDI
Chairman
Readiness Subcommittee
House Armed Services Committee



PETER A. DEFAZIO
Chairman
Committee on Transportation and
Infrastructure



ALEX X. MOONEY
Member of Congress

Selected Factual Errors in DHS Report

Location	Assertion	Correct Information	Notes
Table 1	Financial Requirement 50 microseconds	50 milliseconds (a X 1,000 difference)	https://www.finra.org/rules-guidance/rulebooks/finra-rules/4590
Table 2	NTP and WWV do not meet needs for Financial Sector	They do – see error above	
Table 3	eLoran coverage TBD	1,000km range enables wide coverage w/ few towers. US has had Loran system before. Should read “national” or “continental.”	Table is “Proposed” solutions and should include this available information
	NTP coverage national	Only in areas with network access	Report ignores remote, unserved, underserved Americans
	PTP coverage national		
	STL coverage national	Coverage is global	Satellite system
	NIST WWVB Radio Commercial Use	WWVB is a free service available to all	Report ignores public services, individual citizens
Table 5	eLoran does not meet 5M to 10M accuracy	eLoran w/differential < 10m w/in 30 km of differential station	https://marrinav.com/wp-content/uploads/2020/04/20-03-25-Final-Report-MarRINav-v1.0.pdf
	STL (Satelles) for Navigation	Suitability for moving platforms unlikely, especially > 10 kts	
	NextNav suitable for navigation. Service to over road, open water areas.	<ul style="list-style-type: none"> • Both advertised as positioning services, not navigation systems. • Limited coverage & short range of beacons prevents service to remote roads, most maritime areas. 	DoT Technology GPS Backup Demonstration
	Locata suitable for navigation. Service to over road, open water navigation		

Selected Additional Concerns

Temporary Disruptions

The department concludes without analysis that the federal government should have no role in supporting users' operations during temporary GPS disruptions (note "temporary" is not defined). It suggests that users could delay operations until GPS is restored.

Delaying operations is, of course, completely unacceptable for emergency responders and a vast array of other essential public and essential services. These would continue in a degraded mode, delaying ambulances, eliminating common operational pictures for law enforcement, hampering land mobile radios, etc.

Alternatively, the report says, users should purchase local backup capabilities for GPS. Yet there is no mention about these services being widely available (they are not), nor the potential cost to public and non-profit entities.

A responsible discussion should begin with discussion of questions such as:

- The availability of commercial GPS backup services
- Whether public service groups would be able to afford such services
- The cost in lives and property if they were not
- If it would be in the government's economic interest to provide an enterprise capability to such groups to avoid the much greater expense of each user to fend for themselves
- The real, but largely unseen economic costs of the tens of thousands of GPS disruptions seen across America today. Any decrement of over \$3T in annual benefits is significant.

Safety of Life Concerns

The report states:

"In applications where safety-of-life requires PNT assurance, industry uses alternate and backup systems to maintain that assurance."

This assertion is untrue. As one example, most drones carry only a GPS receiver for navigation. Loss of GPS services (in the short or long term) would pose safety of life concerns with drones potentially interfering with passenger and other manned aircraft.

This also ignores a large group of first responders for whom GPS is essential. Rapid and efficient navigation to the scene of an incident, operational pictures for law enforcement and incident management, and land mobile radios all depend upon reliable GPS signals.

And for most Americans, travel in their automobile would be noticeably less safe without turn by turn verbal directions enabled by GPS

GPS and a Backup as Anti-Competitive

The report fails to recognize that GPS is a common good provided free of charge by the US government for over 25 years. To say that a backup for this common good is anticompetitive suggests that GPS itself is anticompetitive. Does the department suggest that users be charged for using GPS or that it be privatized?

Even if such irresponsible policy positions were adopted, the report makes it clear that GPS and a backup that provides even “graceful degradation” in the event of its failure, would not be anticompetitive. No existing commercial is able to provide the needed services to all Americans, even by to the “graceful degradation” level of care.

Long Term Disruption & Technology Transition

In its section on Long Term Disruption, the report fails to consider the trillions of dollars each year in loss to the US economy, and likely social disruption and loss of life, associated with such an eventuality.

Rather than do so and consider the need for immediate and assertive action, the report lists the difficulties of establishing a backup capability for essential GPS services.

Of the difficulties cited, those associated with a broad technology transitions are discussed most. Especially the long time such transitions often require.

Sixteen years ago, the executive branch resolved to establish a backup system for GPS but has failed to do so. For it to now claim a long transition time as a reason to not start the process is the height of hypocrisy.

It also ignores several key aspects of all technology transitions:

- Users with the greatest interest and need adopt new technology quickly. This will include many users with systems that have the greatest impacts on homeland and national security.
- Government can accelerate adoption when it is in the public interest. This can be done by regulation and/or with incentives. The FAA has often provided monetary incentives to encourage adoption of new aircraft equipment
- New technology such as that envisioned here will be incorporated into future receivers. As existing users not motivated by other concerns are required to refresh their technology, their risk will be automatically reduced.