

GPS Reliability



Statement of The
Air Transport Association of America, Inc.
before the
Subcommittee on Aviation and Subcommittee on Coast Guard and Maritime
Transportation, Committee on
Transportation and Infrastructure,
U.S. House of Representatives
Concerning
“GPS Reliability: A Review of Aviation Industry Performance, Safety Issues, and
Avoiding Potential New and Costly Government Burdens”

June 23, 2011



AIR TRANSPORT ASSOCIATION

Good morning and thank you for the opportunity to testify on this matter, which is so critical to the airline industry, as well as other transportation modes, commercial enterprises and recreational users.

My name is Tom Hendricks. I am the Senior Vice President for Safety, Security and Operations for the Air Transport Association of America, representing the major passenger and cargo airlines of the United States. Prior to joining the ATA, I was a pilot for Delta Air Lines for 23 years, as well as a military pilot for both the Navy and the Air Force.

GPS IS INDISPENSABLE TO THE FUTURE OF AVIATION-EXPANSION OF WIRELESS BROADBAND SERVICES SHOULD NOT SACRIFICE KNOWN BENEFITS OF GPS

I want to emphasize at the outset that while the U.S. airline industry supports public- and private-sector efforts to expand wireless broadband service across the country, we strongly oppose any proposed service that would compromise the integrity of the nation's Global Positioning System (GPS). Given that nearly 6,000 commercial aircraft and tens of thousands of business and general aviation aircraft are GPS-equipped, the continued unimpeded use of GPS is indispensable to the future of aviation.

The Department of Defense (DOD) created GPS for military purposes. It was subsequently authorized for civilian use by President Reagan after Korean Air Lines Flight 007 was shot down in 1983 for straying into Soviet airspace due to a navigation error. This access proved to be one of the finest examples of "turning swords into plowshares" in modern times. GPS has revolutionized navigation for aviation and millions of other users in what has been a true miracle of technology.

GPS signals are generated from a constellation of satellites orbiting 12,600 miles in space. Powered by the sun, GPS satellite transmitters operate at very low power levels – less than the energy output of a 50 watt light bulb. This low-power, long-distance combination means GPS receivers must be extremely sensitive in order to function properly and determine an airplane's position accurately. GPS receivers are built to international standards developed over the last 30 years. The fragile nature of GPS signals has been recognized by government regulators and in international standards and agreements. Accordingly, we were not surprised by several public- and private-sector reports demonstrating that GPS signals would receive substantial interference from LightSquared's radio signals, **which are approximately one billion times more powerful than GPS signals.**

GPS is the world's premier satellite-navigation system because of its dependability and the U.S. government's policy of making both the signal and the receiver design specifications available to the public free of charge. The Federal Aviation Administration (FAA) has continuously improved the accuracy of GPS for aviation users. Thus, we have a long-standing public policy that has very purposely created the environment in which GPS has thrived.

With respect to the U.S. airline industry, over 86 percent of our aircraft are already equipped with GPS. This has been achieved without any regulatory mandate and is based entirely on the remarkable capabilities of this navigation system. We are using GPS-based arrival and departure procedures that are more precise and fuel-efficient than radar and surface-based navigation system procedures and enable increased aircraft throughput.

Discussions of the existing benefits of GPS often focus on congested airspace around major metropolitan areas. But we should also recognize that GPS has enabled new instrument approaches to be introduced at many general-aviation airports and, when augmented by Required Navigation Performance capability, it has enabled the approval of far more precise – and safe – instrument approaches at airports with nearby terrain challenges, such as Juneau, Alaska and Palm Springs, California.

GPS IS A CRITICAL ELEMENT OF NEXTGEN, WHICH WILL IMPROVE SAFETY, REDUCE DELAYS AND MAKE FLYING MORE ENVIRONMENTALLY-FRIENDLY

Today's commercial and general-aviation users are heavily committed to GPS, and its importance to aviation will intensify over the coming decade. As the subcommittee knows, the civil-aviation community has embarked upon the most ambitious transition in air traffic management ever undertaken. The system, known as NextGen, utilizes the positioning function of GPS to provide continuous navigation signals to airplanes, which then downlink a position report at least once a second to air traffic control. This is a significant enhancement over the existing radar-based system, enabling improved air traffic management. GPS will be used in all phases of flight: departure, enroute, terminal area, and approach and landing. GPS is a core technology behind NextGen and will allow the national airspace system, which is increasingly constrained, to accommodate growing air traffic demand reliably and efficiently while, at the same time, reducing greenhouse gas emissions.

GPS spectrum had been protected until the Federal Communications Commission (FCC), in a highly unusual regulatory action, effectively revised its own rules for LightSquared, subject to certain testing conditions. This revision, which the FCC characterized as a waiver, opens the door to the construction of 40,000 high-powered, ground-based transmitters that will effectively jam the GPS network over the populated areas of the United States. This is not an exaggeration. Recent tests by RTCA, a federal advisory panel on aviation navigation and air-traffic management policy, definitively concluded that LightSquared's network would render GPS unusable by aviation users below 2,000 feet in the vicinity of a single-city deployment, and at all altitudes in dense metropolitan areas. Similarly, the National Space-Based Positioning, Navigation, and Timing Systems Engineering Forum concluded that LightSquared's system "cannot successfully coexist with GPS."

SUGGESTED MITIGATION SOLUTIONS ARE UNPROVEN AND COST-PROHIBITIVE, AND WOULD DELAY MUCH-NEEDED NEXTGEN BENEFITS

Given the multiple government and industry reports of GPS interference issues posed by LightSquared's proposed system, LightSquared and GPS industry stakeholders have begun to discuss potential mitigation options. While well-intentioned, the costs to the U.S. airline industry and other GPS users to implement the potential mitigations far outweigh the benefits of allowing LightSquared to deploy its wireless broadband network.

The first mitigation option, proposed by LightSquared earlier this week, would allow LightSquared to operate in the lower part of its currently licensed frequency spectrum at a reduced power setting. While this may be feasible, it is fraught with technical challenges not yet fully understood. Significant research and modeling is required to fully define this mitigation and conclusively prove whether it would achieve the desired effect.

The second mitigation option would be to equip GPS receivers with filters to preclude interference from LightSquared's high-powered neighboring signal. Avionics manufacturers have questioned the feasibility of designing such filtering equipment, which does not currently exist for commercial aviation. It is also possible that filters could interfere with the precision of the GPS signal, thus limiting the usefulness of GPS receivers.

Even if the development of filtering equipment proves technically feasible, the U.S. airline industry simply cannot afford to purchase and install it in approximately 6,600 aircraft, which would cost billions of dollars. This is not a viable option for an industry that has lost \$55 billion and 160,000 jobs over the last decade. Moreover, it would take at least a decade for filters to be developed, tested and then certified

by the FAA. This process would grind NextGen implementation to a halt – along with the creation of at least 150,000 U.S. jobs.

CONGRESS SHOULD PROHIBIT LIGHTSQUARED FROM DEPLOYING THEIR SERVICES IN ANY MANNER THAT INTERFERES WITH GPS

The bottom line is that the U.S. airline industry and other GPS users did not cause this interference problem. We have relied on long-standing U.S. government policy and international standards in the development and implementation of GPS equipment. If the FCC is determined to allow LightSquared to launch its wireless broadband network, the agency should find alternative spectrum that will not compromise the GPS network. Congress should ensure that there is no interference with GPS from wireless broadband deployment.

Thomas L. Hendricks
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Tom Hendricks was named senior vice president of safety, security and operations for the Air Transport Association (ATA) in February 2011. In this role, he is responsible for technical and operational functions of ATA, developing and shaping ATA member positions on flight operations, safety, engineering, air traffic management and security. In addition, he leads ATA's efforts in cargo, passenger facilitation, airport infrastructure and passenger service standards. Hendricks joined ATA as vice president, operations and safety in April 2010.

Prior to joining ATA, Tom oversaw day-to-day flight operations at Delta Air Lines as director of line operations. As a captain, Hendricks previously served as chief pilot in Atlanta and represented Delta on several key industry groups. He has extensive line flying experience on the Boeing 767-300ER, DC-9, Boeing 727, Lockheed L-1011 Tri Star and MD-88 aircraft.

A retired Air Force Reserve colonel and career fighter pilot, Hendricks also served on active duty as a United States Navy officer on the USS MIDWAY (CV-41) and as an instructor pilot at the United States Navy Fighter Weapons School. A native of Fairfield, Ohio, Hendricks graduated from The Citadel in Charleston, S.C. with a Bachelor of Arts in Mathematics with Secondary Emphasis in Business Administration.

COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE
Truth in Testimony Disclosure

Pursuant to clause 2(g)(5) of House Rule XI, in the case of a witness appearing in a nongovernmental capacity, a written statement of proposed testimony shall include: (1) a curriculum vitae; and (2) a disclosure of the amount and source (by agency and program) of each Federal grant (or subgrant thereof) or contract (or subcontract thereof) received during the current fiscal year or either of the two previous fiscal years by the witness or by an entity represented by the witness. Such statements, with appropriate redaction to protect the privacy of the witness, shall be made publicly available in electronic form not later than one day after the witness appears.

(1) Name:

Thomas L. Hendricks

(2) Other than yourself, name of entity you are representing:

Air Transport Association

(3) Are you testifying on behalf of an entity other than a Government (federal, state, local) entity?

YES

If yes, please provide the information requested below and attach your curriculum vitae.

NO

(4) Please list the amount and source (by agency and program) of each Federal grant (or subgrant thereof) or contract (or subcontract thereof) received during the current fiscal year or either of the two previous fiscal years by you or by the entity you are representing:

N/A

Signature

Date



6/22/2011