

**STATEMENT OF
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**BEFORE THE
NATIONAL SECURITY AND FOREIGN AFFAIRS SUBCOMMITTEE
HOUSE COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM**

**HEARING ON:
GPS: CAN WE AVOID A GAP IN SERVICE?**

MAY 7, 2009

Chairman Tierney, Ranking Member Flake, and Members of the Subcommittee:

I am Karen Van Dyke, Acting Director for Positioning, Navigation and Timing in the U.S. Department of Transportation's Research and Innovative Technology Administration (RITA). I appreciate the opportunity to appear before you today to discuss the criticality of the Global Positioning System to the civil user community.

GPS technology is increasingly woven into the fabric of American society, from cars and planes to cell phones and wristwatches. It improves productivity and efficiency in many areas of commerce. For example, today's construction, farming, mining, shipping, surveying, and traffic management systems have become dependent on GPS. The technology enhances public safety by preventing transportation accidents and by reducing the response times of ambulances, firefighters, and other emergency services. It allows agriculture operations to continue through low visibility field conditions such as rain, dust, fog and darkness, and to apply chemicals precisely, reducing environmental impact while reducing production costs. GPS also furthers scientific aims such as weather forecasting, earthquake prediction, and environmental protection.

Furthermore, the precise GPS time signal, derived from atomic clocks, is embedded in critical economic activities such as synchronizing communication networks, managing power grids, and authenticating electronic transactions.

Importance of GPS to NextGen

Of particular interest to the Department of Transportation is the Federal Aviation Administration's (FAA) Next Generation Air Transportation System (NextGen) program. NextGen is a wide-ranging transformation of the national air transportation system to meet future demand and support the economic viability of the system while reducing delays, improving safety, and protecting the environment. NextGen will change the way the system operates – reducing congestion, noise, and emissions, expanding capacity and improving the passenger experience. NextGen is a highly complex, multilayered, evolutionary process of developing and implementing new technologies and procedures.

NextGen will reduce fuel burn and greenhouse gas emissions, allow more direct, time-based routings, enable safer operations, and reduce runway incursions. United Airlines already has pioneered the use of tailored arrivals based on GPS from Honolulu to San Francisco, with a fuel savings of 1,600 pounds per flight.

GPS is the foundation for NextGen navigation and surveillance. The continuity of funding and integrity of the planned launch schedule of the GPS constellation is vital to the nation moving ahead with NextGen.

Commitment to GPS

I would like to thank the Air Force for their dedicated service in providing extremely reliable operation of GPS since it achieved Initial Operating Capability in 1993. The United States clearly is the leader in space-based positioning, navigation, and timing and we must continue to maintain and improve GPS, its augmentations, and backup capabilities to meet growing national security, homeland security, economic security, civil, and scientific demands, and to maintain this U.S. technology leadership position.

Sustainability of the GPS constellation is critical to users worldwide. The Department of Transportation is committed to modernization of GPS and providing funding to ensure the development and modernization of the next generation of GPS to provide new civil capabilities. Fully funding the DOT portion of GPS modernization is critical to ensuring that the GPS III program remains on schedule to ensure future constellation sustainment.

The Department of Transportation is confident that the Department of Defense will continue to operate GPS at or above the minimum GPS Performance Standard commitment of 21 healthy satellites 98 percent of the time, equivalent to 24 healthy satellites 95 percent of the time and will find innovative methods to extend the life of the GPS satellites to prevent any gaps in availability. We recognize that GPS has exceeded performance commitments with 30 satellites currently operational, and that some users may have come to expect this level of service.

Mitigation of Disruption

The Department of Transportation is a provider, as well as a user, of GPS services, augmenting the GPS signal to improve accuracy and integrity. FAA provides the Wide Area Augmentation System (WAAS), and RITA coordinates resources and plans for the inland component of the Nationwide Differential GPS System (NDGPS), operated and maintained by the U.S. Coast Guard. WAAS and NDGPS stations are a part of the National Oceanic and Atmospheric Administration (NOAA)-managed national Continuously Operating Reference Stations or CORS network of over 1300 permanently operating GPS receivers maintained by over 200 federal, academic and private organizations. The U.S. Air Force, U.S. Coast Guard, and the Federal Aviation Administration have agreements to coordinate and provide notification of GPS performance and any disruptions of GPS service to the user community.

For aviation users relying on unaugmented GPS, when the constellation is at its minimum GPS Performance Standard commitment, outages will be experienced on a routine basis, which could

result in complaints and economic impact. For users who equip with GPS augmented by WAAS, the impacts are reduced, supporting minimum availability requirements of 99% or more.

However, like any radionavigation system, GPS is vulnerable to interference that can be reduced, but not eliminated. In 2001, RITA's Volpe National Transportation Systems Center issued the "Vulnerability Assessment of the Transportation Infrastructure Relying on the Global Positioning System". The findings of this assessment indicated that there was awareness within the transportation community of risks associated with use of GPS as a primary means for position determination and precision timing. Due to the reliance of transportation on GPS signals, it is essential that threats be mitigated and alternative back-ups be available, and the system be hardened for critical applications. DOT has determined that sufficient alternative navigation aids currently exist in the event of a loss of GPS based services.

Potential back-up capabilities to GPS are being explored as part of a National Positioning, Navigation and Timing (PNT) Architecture study, initiated in 2006 at the request of the Assistant Secretary of Defense for Networks and Information Integration and DOT's Under Secretary of Transportation for Policy. The overarching goal of the architecture, with GPS as its cornerstone, is intended to overcome identified capability gaps, and achieve an evolutionary path to providing integrated space-based, terrestrial, and autonomous solutions in the 2025 time period that will ensure the continuity of government-provided PNT services.

In conclusion, I would like to thank the Committee for allowing me to discuss the civil user perspective of GPS. The Department of Transportation is committed to continue our strong working relationship with the Department of Defense to maintain our global leadership in space-based PNT.

I would be glad to answer any questions you may have.