UNITED STATES
DEPARTMENT OF TRANSPORTATION

GPS Adjacent Band Compatibility Assessment

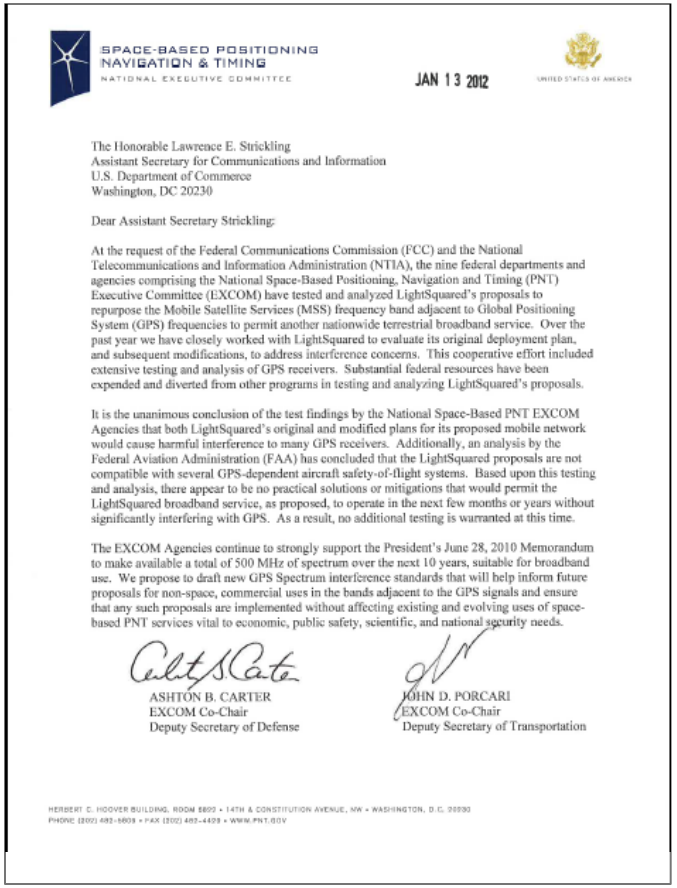
Civil GPS Service Interface Committee Meeting

Karen Van Dyke

September 17, 2013

Background

- January 13, 2012 National Space-Based Positioning, Navigation, and Timing (PNT) Executive Committee (EXCOM) co-chair letter to National Telecommunications and Information Administration (NTIA) proposed to draft new Global Positioning System (GPS) spectrum interference standards:
  - Inform future proposals for non-space, commercial uses in the bands adjacent to the GPS signals.
  - Ensure such proposals are implemented without affecting existing and evolving uses of space-based PNT that are vital to economic, public safety, scientific, and national security needs.



SPACE-BASED POSITIONING
NAVIGATION & TIMING
NATIONAL EXECUTIVE COMMITTEE

JAN 13 2012

The Honorable Lawrence E. Strickling
Assistant Secretary for Communications and Information
U.S. Department of Commerce
Washington, DC 20230

Dear Assistant Secretary Strickling:

At the request of the Federal Communications Commission (FCC) and the National Telecommunications and Information Administration (NTIA), the nine federal departments and agencies comprising the National Space-Based Positioning, Navigation and Timing (PNT) Executive Committee (EXCOM) have tested and analyzed LightSquared's proposals to repurpose the Mobile Satellite Services (MSS) frequency band adjacent to Global Positioning System (GPS) frequencies to permit another nationwide terrestrial broadband service. Over the past year we have closely worked with LightSquared to evaluate its original deployment plan, and subsequent modifications, to address interference concerns. This cooperative effort included extensive testing and analysis of GPS receivers. Substantial federal resources have been expended and diverted from other programs in testing and analyzing LightSquared's proposals.

It is the unanimous conclusion of the test findings by the National Space-Based PNT EXCOM Agencies that both LightSquared's original and modified plans for its proposed mobile network would cause harmful interference to many GPS receivers. Additionally, an analysis by the Federal Aviation Administration (FAA) has concluded that the LightSquared proposals are not compatible with several GPS-dependent aircraft safety-of-flight systems. Based upon this testing and analysis, there appear to be no practical solutions or mitigations that would permit the LightSquared broadband service, as proposed, to operate in the next few months or years without significantly interfering with GPS. As a result, no additional testing is warranted at this time.

The EXCOM Agencies continue to strongly support the President's June 28, 2010 Memorandum to make available a total of 500 MHz of spectrum over the next 10 years, suitable for broadband use. We propose to draft new GPS Spectrum interference standards that will help inform future proposals for non-space, commercial uses in the bands adjacent to the GPS signals and ensure that any such proposals are implemented without affecting existing and evolving uses of space-based PNT services vital to economic, public safety, scientific, and national security needs.

ASHTON B. CARTER
EXCOM Co-Chair
Deputy Secretary of Defense

JOHN D. PORCARI
EXCOM Co-Chair
Deputy Secretary of Transportation

HERBERT C. HOOVER BUILDING, ROOM 6802 • 14TH & CONSTITUTION AVENUE, NW • WASHINGTON, D.C. 20230
PHONE (202) 482-5809 • FAX (202) 482-4429 • WWW.PNT.GOV

DOT GPS Adjacent Band Compatibility Assessment

- Deputy Secretary Tasking to FAA and RITA:
  - Collaborate to develop a spectrum protection plan which provides a framework to define the processes and assumptions for development of GPS spectrum protection criteria on behalf of GPS civil users.
- GPS Spectrum Protection Plan will identify the processes for:
  - Deriving adjacent-band power limits, as a function of offset frequency, necessary to ensure continued operation of all applications of GPS services.
  - Determining similar levels for future GPS receivers utilizing modernized GPS and interoperable Global Navigation Satellite System (GNSS) signals.

DOT Methodology

- **Using FCC/NTIA-defined planned application in frequency bands adjacent to GPS**
  - Deployment scenario
  - Signal structure
  - Transmitter characteristics
- **Determine GPS receiver interference tolerances**
  - Set 1: Current receivers - Aviation standards (MOPS) or measured results for most GPS receivers which do not have defined standards
  - Set 2: Develop for next-generation multi-frequency/multi-constellation GNSS receivers
- **Define interaction scenarios**
  - GPS receiver use/location (airborne, urban, rural, etc.)
  - Terrestrial transmitter density
- **Specify adjacent band power limits for proposed new application as a function of frequency offset from GPS**

Planned Next Steps

- **Engage with GPS Receiver Manufacturers through Federal Register Notice**
  - **Receiver Filter Characteristics**
  - **Interference Mask Development**
  - **Receiver Application Areas**
  - **Transition Timeline for Receivers for Each Application**
  - **Future Direction for GPS/GNSS Receiver Development**

- **Parallel Effort with DOT Extended Pos/Nav Working Group**
  - **User Interaction Scenarios**