SPACE-BASED POSITIONING
NAVIGATION & TIMING
NATIONAL ADVISORY BOARD

August 3, 2011

The Honorable Julius Genachowski
Chairman
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

RE: LightSquared Subsidiary LLC and interference with GPS services

Chairman Genachowski,

The National Space-based PNT Advisory Board was formed under the Federal Advisory Committee Act (FACA) to advise the United States government per National Security Presidential Directive (NSPD-39), and represents the major sectors of the Global Positioning System (GPS) user community. It is a panel of independent experts supported by two Administrations with over 250 years of cumulative experience with GPS applications. With this letter, this Board reaffirms its stated position that GPS would suffer great harm from the proposed LightSquared terrestrial operation as indicated in the conditional waiver approved by the Federal Communications Commission (FCC) in January. This unanimous position was developed at the 8th meeting of the full National Space-based PNT Advisory Board on June 9-10 in Washington D.C. based on the study results, reports, and open discussions at that meeting.

The proposal would radically change a primary space-to-earth radio band to allow high-power terrestrial broadcasts. As shown by comprehensive industry and government testing and analyses, if this proposal were allowed to proceed, it would have the unavoidable consequence of adversely impacting current and planned Federal and private sector infrastructure. The costs would be tens of billions of dollars per year. Such a loss would impact our nation's national security, international standing and have a notable economic impact. It is not an acceptable alternative to impose this burden on behalf of a single company. For that reason, the National PNT Advisory Board formally requests that the Federal Communications Commission rescind the conditional waiver approving LightSquared terrestrial operations in the MSS radio band from 1525-1559 MHz, and instead select an appropriate band that would avoid the substantial collateral damage in its understandable quest to bring broadband to the American public.

We would like to emphasize the following points in support of this request:

- With about a billion users, GPS frequencies are absolutely not "underutilized". There is probably more information traffic (albeit one-way) than any other application that you manage.
- GPS innovations over the past two decades have been made possible by prudent spectrum management decisions that protected the spectrum environment in which GPS and other GNSS constellations operate. GPS is not merely a navigation service. Indeed, it is a major backbone to the infrastructure of our whole nation. Based on a recent economic study, high precision GPS applications contribute over 90 billion dollars to the economy each year. They rely on the full band GPS receivers that have been developed over the last 15 years.

- These sophisticated, well-designed GPS devices can easily tolerate power levels in adjacent bands that are one million times stronger than GPS in the adjacent MSS band. However, the proposed power levels are as much as 5 billion times stronger than GPS. They cannot be "filtered" without gravely crippling GPS productivity gains. Any conjecture to the contrary should be demonstrated and exhaustively tested before accepting such statements.
- Simple retrofits of the almost 1 million full-band GPS receivers are not possible. Such suggestions do not recognize the nature of GPS receivers that allow positioning to sub-centimeter level accuracy and must maintain timing to 1/10th of a billionth of a second. GPS receivers provide navigation and time - they are quite different from devices that enable communications. Any additional filter, if found, is expected to seriously compromise the accuracy and performance of the GPS devices.
- The tests to date are scientific and conclusive. In fact they seriously understate expected effects, since the LSQ transmitters were operating at 1/10th of licensed power (1548 watts) and with only a single transmitter. The proposed deployment would have many LSQ transmitters in view and the interference to GPS would be many times worse than the test results.
- The suggestion that the lower LSQ band will not significantly harm GPS is false. Actual testing shows **even the lower band, if actuated, would impact all 33 of the high performance, productivity-enhancing sets that were tested**. These receivers serve agriculture, construction, precision machine control, survey, and emergency responders. Contrary to some statements, these critical applications are imbedded in urban as well as rural environments. It is estimated that 22 million cell phones would be disabled as well.
- The newer military signal (Lm) and the international signal (L1C) that will allow interoperability with the European GPS equivalent (Galileo) broadcast a wider bandwidth than the current GPS civil signal and must also use full band receivers. Thus, they will suffer the same impairments for both the proposed upper and lower bands.
- At the same time, there will be immediate deleterious effects on aviation. Aircraft below 10,000 feet would no longer be able to rely on GPS. The current FAA integrity alarm system (WAAS) will be rendered inoperative. With that, the 2,500 new GPS airport approaches will be eliminated, and several thousand additional airports will not enjoy the planned safety benefits of WAAS. In addition, the future Air Traffic Control System (NextGen) will have to be redesigned at a cost of many billions of dollars and serious delay in modernizing ATC and reducing airport delays.

We strongly recommend that the Commission rescind its conditional wavier and not allow a change in the structure of the MSS band that abuts GPS to allow transmissions that interfere with GPS. Another frequency band must be found, well away from GPS that allows LightSquared to compete with the other broadband suppliers and does not jeopardize US infrastructure, imposing unnecessary costs to the many millions of current GPS users.

Hon. James R. Schlesinger
Chairman
National PNT Advisory Board

Dr. Bradford Parkinson
Vice-Chairman
National PNT Advisory Board

Cc: Hon. William J. Lynn III
Hon. John D. Porcari