



September 15, 2011

Honorable Michael Turner  
Chairman, Strategic Forces Subcommittee  
House Armed Services Committee  
2454 Rayburn House Office Building  
Washington, DC 20515

Honorable Loretta Sanchez  
Ranking Member, Strategic Forces Subcommittee  
House Armed Services Committee  
1114 Longworth House Office Building  
Washington, DC 20515

**Re: 9/15/11 Hearing on Sustaining GPS for National Security**

Dear Chairman Turner and Representative Sanchez:

On September 15, 2011, the Strategic Forces Subcommittee of the House Armed Services Committee held a hearing examining LightSquared and GPS. The testimony for this hearing extensively discusses this technical issue and the history of LightSquared's license to provide services. As LightSquared was not invited to the hearing to provide our point of view, we instead provide the following corrections for the record, which are material to the Subcommittee's consideration of this issue.

Although LightSquared is compelled to correct the record of this proceeding, we also want to make clear that we are committed to working with the FCC, NTIA, DoD and other federal agencies to ensure that we can build our network while maintaining a fully robust GPS system. We look forward to continuing to work with all of the agencies appearing before this Subcommittee in this process going forward.

**The January Waiver is Not Relevant to Interference Concerns**

General Shelton says at page 3-4 of his statement that a waiver received by LightSquared from the FCC in January "would permit LSQ to provide terrestrial-only service" and "fundamentally alter the use of the Mobile Satellite Service frequency band immediately adjacent to GPS L1 by allowing a ground-based 4G broadband network to become the primary user—previously only transmissions of a similar strength to the GPS signal were allowed."

These statements are incorrect. To be clear, and as acknowledged by Mr. Russo in his testimony, the issue at hand is caused because GPS receivers look into LightSquared's spectrum and can be overloaded as a result of the fact that the signal LightSquared's base stations transmit is many times more powerful than a GPS signal. This power level has, however, been authorized for years and is similar to power levels at which other wireless carriers operate today.

Ground operations were first approved under the previous Republican administration and have continued to be part of wireless policy under the current Democratic administration. Specifically, FCC rules first allowed ground networks in LightSquared's band in 2003. LightSquared received specific authorization from

the FCC to build a ground network in 2004, and was authorized to use ground transmissions of up to 1.6 kw in 2005. This is the power level that LightSquared will use in its deployment today. At each stage of this process, the Department of Defense (DoD) reviewed and approved the FCC actions through the Interdepartment Radio Advisory Committee (IRAC) process administered by NTIA. Indeed, in a six month study commencing in 2009, DoD's Joint Spectrum Center reviewed a specific proposal from LightSquared's predecessor to build a network using many times this power, with thousands of base stations along the East Coast. Accordingly, DoD has been well aware that LightSquared could use much more powerful signals than those used by GPS.

The January waiver did not change the power of LightSquared's ground network or the number of base stations it was authorized to build. It only allowed LightSquared to add ground-only devices to a network that will *continue* to also feature integrated devices linking to both the satellite and ground networks. Indeed, LightSquared must observe specific regulatory conditions to continue to provide an integrated satellite service. The January waiver thus did not impact the interference issue in any way whatsoever – LightSquared could have built exactly the same network in 2005 as it is building today. The overload issue would be the same whether LightSquared was deploying 1, 1,000, or 40,000 base stations. None of the testimony before the Subcommittee specifically explains how the waiver changed an already existent interference issue – one that the GPS manufacturers should have raised six years ago.

GPS manufacturers have, however, repeatedly argued that this issue was somehow created in January. They have done so in order to distract policymakers from the fact that while they were aware of the fact that a ground network had been authorized in 2005 that could overload GPS receivers, they did nothing to change the design of those receivers or otherwise prepare for stronger signals in LightSquared's band. GPS manufacturers have had at least six years to prepare for this plan and have yet to consider their obligation to stop encroaching upon spectrum allocated to LightSquared.

#### **GPS Testing Has Not Been Made Available**

General Shelton's testimony at page 6 states that "the NPEF test results also are consistent with results obtained by commercial GPS industry organizations such as Trimble, Garmin and John Deere through their own independently conducted tests." It is unclear what results of independently conducted tests General Shelton means, and the extent to which these results have been made public for review and comment. To the extent General Shelton's testimony cites results that have not been made public, then LightSquared would ask the Subcommittee to require public disclosure of these results.

#### **Specific Test Results Conflate Old and New Proposals**

From page 6 on, General Shelton's statement deals with the NPEF test results, but does not distinguish between results for the testing of LightSquared's original planned deployment and testing of the spectrum farthest away from GPS (referred to as the "lower 10 MHz"), to which LightSquared has proposed to move. Neither does CIO Takai's testimony at pages 4-5. Notably, the NPEF's own public presentation of its results stated that "5 and 10 MHz Low signals caused minimal effects on the limited set of receivers that were tested."<sup>1</sup>

#### **All Information Necessary for Analysis is Available**

At page 5, CIO Takai states that "DoD at this time has not received a sufficiently clear and complete description of a LightSquared Lower 10 MHz deployment plan to professionally analyze its new aggregate interference environment." LightSquared has provided all information requested by DoD and NTIA throughout this process. Since it first made its proposal in late June, it has not yet heard from DoD that any

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<sup>1</sup> NPEF, LightSquared Effects on GPS, Test Analysis & Results (June 9, 2011) at slide 7, posted at <http://www.pnt.gov/advisory/2011/06/bunce.pdf>.

further information beyond what has been provided to date was required to enable further testing or analysis of its proposal.

### **Proposals for Addressing Precision Receivers**

At pages 10-11, General Shelton states that there are no mitigation options for precision receivers such as Deere's Starfire and states all NPEF tested high precision receivers experienced "unacceptable interference." While he points out that this was limited testing and does not constitute "sufficient evaluation," the Technical Working Group testing showed that 10 out of 38 commercial precision devices tested could coexist with operations in the lower 10 MHz, even using the stricter definition of harmful interference referenced by General Shelton. LightSquared has also made significant proposals to fund development of resilient precision receivers, and to place satellite-based augmentation signals close to the GPS band that have not been recognized in the testimony today.

### **GPS Manufacturers Have Responsibility for Their Own Technical Design**

Also at pages 10-11, General Shelton states that "GPS receivers were quite purposefully designed to operate in a portion of the radio frequency spectrum deliberately maintained as a 'quiet neighborhood,' with neighboring frequencies primarily occupied by signals of comparable power levels, all based on the widely accepted understanding of previous FCC rules and intent." As noted above, the FCC explicitly allowed the currently planned power level of 1.6 kw in 2005 – six years ago. The testimony does not explain what "widely accepted understanding" it refers to, as this power level was a plain, unambiguous technical parameter of LightSquared's authorized network. Any reliance the GPS manufacturers may have had on use of LightSquared's authorized bands for satellite only use was surely ended at that time.

Notably, this is exactly what the DoD told GPS manufacturers they needed to do in its 2008 Standard Positioning Service Performance Standard. This Standard provides clear notice that GPS users will not be protected outside of the GPS band. This principle also has been endorsed by the International Telecommunications Union and serves as the guiding principle for the FCC's treatment of unlicensed receivers, such as GPS receivers. The SPS PS sets forth the performance manufacturers can expect from the GPS constellation, but is conditioned on using a "sharp-cutoff filter bandwidth at 24 MHz" – in other words, filtering out adjacent band signals outside this range. As the Information Technology and Innovation Foundation (ITIF) has stated, "it appears that many, but not all, of the problems with existing GPS devices are the result of poor engineering practice and failure to abide by DoD directives on noise immunity."<sup>2</sup>

Moreover, a 2005 report of a Task Force of the Pentagon's Defense Science Board made clear that the vulnerability of even military GPS receivers to jamming and interference is of primary concern and that DoD should take immediate steps to correct this vulnerability. The appropriate response of DoD should be to require GPS manufacturers to only sell GPS receivers to DoD that have been designed to receive interference from lawful transmissions in adjacent frequency bands.

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<sup>2</sup> Comments of ITIF, IB Docket No. 11-109 (filed August 15, 2011) at 14.

### **Cost Impact**

On page 11, General Shelton states that a study by NDP Consulting “estimates the costs to GPS commercial users and manufacturers alone at \$48.3 billion in research & development and replacement costs if just 50 percent of users required redesign and/or replacement of their equipment.” The NDP Consulting study was supported by the Save Our GPS Coalition, and thus should not be viewed as an unbiased estimate.<sup>3</sup>

Moreover, the \$48.3 billion figure was not for R&D and replacement. The study clearly states that \$48.3 billion was the study’s estimate of the annual economic “cost” to the United States if 50% of all commercial GPS receivers were “disrupted.”<sup>4</sup> No one has suggested any mitigation plan that would result in 50% of GPS receivers being rendered unusable. Indeed, the current proposals would allow the vast majority of receivers – over 400 million – to function exactly as they always have, and would require further work on less than 500,000 precision receivers – 0.125% of GPS receivers.

### **Inmarsat Receivers**

At page 5, CIO Takai’s testimony raises the issue of interference with Inmarsat receivers. Mr. Nebbia’s testimony raises the issue at page 6. This issue is not relevant to GPS receiver overload. As part of the rebanding of the L-band pursuant to a 2007 agreement between Inmarsat and LightSquared, the two companies have agreed to provide a transition for all users of Inmarsat services, including DoD. There is currently a process for this transition and LightSquared has worked closely with both Inmarsat and DoD to effect this transition with minimal impact to the DoD user community.

### **Conclusion**

While LightSquared has provided the above corrections to the record, we hasten to add that we do not, in any way, disagree with the repeated statements in the testimony regarding the desire and need for further cooperative work. LightSquared has put forward serious proposals at no small cost to itself to address these issues, in the belief that American consumers and government users deserve both a robust GPS and a competitive wireless broadband network.

Thank you for your attention to this matter, and do not hesitate to contact us if we can be of any help to the Subcommittee, its Members or staff.

Sincerely,

/s/Jeffrey Carlisle  
Executive Vice President  
Regulatory Affairs & Public Policy

703-390-2001

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<sup>3</sup> NDP Consulting, The Economic Benefits of Commercial GPS Use in the U.S. and the Costs of Potential Disruption (June 2011), 1 n.1, posted at <http://www.ndpconsulting.com/docs/GPS%20Report%20June%2021%202011.pdf>.

<sup>4</sup> Id. At 2.