1. INTRODUCTION

This document responds to the “Consolidated Opposition of LightSquared Subsidiary LLC” (“Consolidated Opposition”), dated March 14, 2011. The Consolidated Opposition was in response to multiple filings, including my own which was submitted on February 25, 2011.

2. THE PROOF OF THE PUDDING IS IN THE EATING

The meaning of this old proverb is often summed up as: “Results are what count...it’s not how you start, but how you finish.” Understanding this, the FCC required that a technical working group (TWG) be established to determine whether the LightSquared signals will or will not interfere with GPS. LightSquared requested the U.S. GPS Industry Council (USGIC) to co-chair the working group, and excellent technical experts are involved on both sides. The experts appear to be cooperating effectively, and good progress is expected.

A key element of the TWG activity will be extensive tests of several types of GPS receivers with actual LightSquared signals and filters, both in the laboratory and in field environments. To my knowledge such extensive testing did not take place prior to the 2002 agreement between LightSquared and the USGIC referenced in the Consolidated Opposition (the “2002 Agreement”).
In the Consolidated Opposition, LightSquared appears to take the position that previous agreements and understandings are extremely significant. For example:

“Although the filers characterize this issue as new, the potential for interference to GPS receivers, and the prospect that ATC base stations will be numerous, have long been known and considered.”

Also:

Throughout these proceedings, GPS interference concerns were explicitly considered by the Commission. In comments on the 2001 ATC Application, two parties—. . .—expressed concern with the potential for ATC base stations to overload GPS receivers.⁷ In response . . ., various parties, including NTIA and the United States GPS Industry Council (“USGIC”), offered suggestions . . . Those comments led to an agreement between LightSquared and the USGIC in 2002 (the “2002 Agreement”).⁹ The 2002 Agreement committed LightSquared to limits on the out-of-band emissions (“OOBE”) into the GPS band from its base stations and user devices.¹⁰

Agreements and understandings do shed light on the current situation, but the real question must be whether LightSquared signals do or do not cause GPS interference. The answer ultimately rests on two types of testing. The first type will be conducted by the TWG and by GPS companies, government agencies, and perhaps other groups. If tests show harmful interference, the FCC must not allow deployment of LightSquared ATC transmitters.

However, even if the current tests and evaluations show little or no interference, the second type of testing will occur if deployment begins. This is testing by the public. As we are all too aware, medicines and medical devices previously approved by the FDA are attacked every day in radio, television, newspaper, and other advertisements. If GPS users or user groups or other industry groups believe LightSquared transmissions degrade GPS services, a strong negative public reaction should be expected.

The Consolidated Opposition argues in Section III, for example, that “the Applications for Review should be treated as Petitions for Reconsideration because they raise factual and legal matters the International Bureau has not had an opportunity to consider.” The real issue before
the FCC must not be whether the Applications for Review were properly labeled or not. The real issue must be whether LightSquared ATC signals degrade GPS performance or not. If they do, deployment should not be allowed unless and until a known and tested solution that is cost-free to established users is in place, regardless of petition labels, previous agreements, etc. The proof of the pudding is in the eating, and that includes the impact on hundreds of millions of GPS users.

The work being done by the companies participating in the TWG is exemplary and important. If they find interference, the issue for now should be settled. If not, however, work must continue until it is certain that products from other companies with other users are not affected.

3. MOST GPS RECEIVER DESIGNS ARE GUIDED BY THE MARKETPLACE

The Consolidated Opposition seems to characterize the current situation as:

- Prior agreements about Out of Band Emissions (OOBE) should protect GPS.
- Prior concerns with overload were expressed in 2001, which led to suggestions from NTIA and the USGIC, which led to “an agreement between LightSquared and the USGIC in 2002”, presumably meaning these issues were settled and should not be raised again.
- The FCC took these concerns into account and imposed “two requirements on LightSquared. The first is the set of OOBE limits contained in the 2002 Agreement.”

Based on this characterization, LightSquared and the FCC have asked the logical question of why any company would design GPS receivers which don’t filter out or otherwise ignore strong signals in the adjacent MSS band. The simple answer is that they didn’t have to. The MSS band has always been designated for satellite-to-earth signals, which posed no threat to GPS.

Most GPS receiver designs are guided by the marketplace, not industry standards. GPS signals are well-defined by government documents, and the nearby spectrum is benign. Receiver manufacturers are driven by what can be done to make their products perform better and be more desirable than a competitor’s products. The accuracy of high value products is enhanced by a
wide RF bandwidth. For consumer products, cost and sensitivity are two of the most important competitive drivers, e.g., for cell phone and car navigation products. Thus, cost-efficient filters with low insertion loss are important, encouraging relatively wide bandwidths. The competitive marketplace, the actual interference environment, and no perceived threat from the MSS band, as shown in FCC and NTIA frequency allocations, mean that lack of protection against strong ATC signals has not been a priority, so current GPS receiver characteristics should not be a surprise.

4. RELATIVE NATIONAL IMPORTANCE

Another practical aspect of this issue is the relative national importance of current GPS services versus proposed LightSquared services. The Consolidated Opposition states:


... the facts comprising LightSquared’s showing amply support a waiver because they demonstrate that the underlying purpose of the integrated service rule will be satisfied and that public interest benefits will be provided.

This statement begs the question of the relative national importance of the two services. All should be aware that since 2004 GPS has been designated “a key component of multiple sectors of U.S. critical infrastructure.” On the other hand, broadband wireless access is used primarily for mobile Internet access, for playing games, and for watching movies and other video.

In the view of an industry participant and observer, “[... the United States isn’t facing a future spectrum shortage; it’s facing a bandwidth problem.” “Throwing spectrum at the bandwidth problem doesn’t solve the problem [...].” “Video is the problem. It is going to be what clogs up the bandwidth long-term.”

This argument makes sense. Voice, texting, and Internet searches, including downloads, occupy trivial bandwidth compared to people watching movies or other video material. Of course mobile video service will generate billions of dollars of revenue for providers, but it is not

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clear how it “will enable businesses to grow faster, students to learn more, and public safety officials to access state-of-the-art, secure, nationwide, and interoperable mobile communications.” These goals can be achieved even if entertainment video must be limited. GPS service benefits not only critical defense and public infrastructure but already generates billions of dollars and tens of thousands of jobs for the U.S. economy.

5. INTERFERENCE FROM THIRD ORDER INTERMOD AND HANDSET OOBE

Space doesn’t allow for a full treatment of this subject, but third order intermodulation products of signals from ATC transmitters will fall directly in the GPS frequency band and are a serious threat. This requires testing with full Phase 2 LightSquared signals and evaluation of sources, e.g., nonlinearities within GPS receivers as well as in corroded metal structures near the transmitters. The effect is well known and must be carefully evaluated.

Equally or more important is the OOBE of LightSquared handsets into the GPS band as stated on page 29 of the GPS Working Group Progress Report #1, filed with the FCC on March 15, 2011. These signals are defined as 10 dB stronger than the ATC OOBE, and, worse, handsets will be close to GPS receivers. These concerns also must be carefully evaluated before LightSquared deployment can be approved.

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CERTIFICATE OF SERVICE

I, Thomas A. Stansell, Jr., do hereby certify that a true and correct copy of the foregoing “Reply” was served by U.S. mail, first class, postage-prepaid, on the 29th day of March, 2011 on the following:

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