



LightSquared's Proposed "Solution" to GPS Issue is a Non-Starter *Would Cause Harmful Interference for Millions of GPS Users*

LightSquared sought quick FCC action on its plans to deploy 40,000 ground stations and a tight deadline for conducting the industry's Technical Working Group study on the problem of interference with GPS signals. But LightSquared then asked for postponement of the deadline for completing the interference study and unilaterally – before either completion or submission of the study – announced its so-called "solution" for it. All this came out of the blue, without the knowledge, agreement or consensus of the industry group studying the problem.

That may well be because virtually nothing has actually changed in this "new" proposal relative to what LightSquared pledged at the outset of testing. The power levels don't change. Nor do the frequencies. In fact, the only thing that has changed is the **order** in which the channels within the band adjacent to GPS would be deployed.

LightSquared's announced "solution" has two components:

- LightSquared acknowledges that "[e]arly test results indicated that one of LightSquared's 10MHz blocks of frequencies poses interference to many GPS receivers." LightSquared states that for "the next several years" it would not operate in this band – which is directly adjacent to GPS spectrum and is referred to as the "upper MSS band." During this period, LightSquared would commence operations in a second 10 MHz block of the MSS band, referred to as the "lower MSS band," slightly further away from GPS.
- "LightSquared will modify its FCC license to reduce the maximum authorized power of its base-station transmitters by over 50 percent. This action will limit LightSquared to the power it was authorized to use in 2005."

But this hastily-arrived-at, Hail Mary "solution" – devised before the study group's findings were in and contained in a two-page news release that cites no credible, independent validation of its claims – is not a solution in any shape, form or fashion.

LightSquared's "solution" is not a move to an alternative frequency band. Nor is it a reduction in power relative to what has been tested from the beginning. The "solution" would cause massive disruption to millions of Americans in their everyday lives as well as to many critical U.S. economic sectors, later followed – after "the next several years" – by even more interference to more GPS users. The conclusion from the information below is inescapable: ***The only real solution to the LightSquared interference problem is to move out of the MSS band altogether.***

1) LightSquared's claim that lower band operations would be largely free of interference for non-high precision GPS users is simply not true.

LightSquared states in its news release "solution" that the "test results show this lower block of frequencies is largely free of interference issues with the exception of a limited number of high precision GPS receivers. . . ."

This is simply not true, and LightSquared should have known better from its involvement in the FCC working group. Because LightSquared initially insisted on operating in both the upper and lower MSS bands, despite substantial evidence of interference, most of the tests conducted looked at this scenario, so only limited test results for lower band-only operations are available. So even for those sectors where reduced interference in the lower-band was found, the results are limited and inconclusive.

For many other sectors, and not just high precision GPS, these limited lower-band test results actually show significant interference to most of the devices that were studied. For example, the “general navigation” subgroup found the following: “Lab testing revealed that many devices suffered from harmful interference from the lower 10 MHz channel; specifically, 20 out of 29 devices experienced harmful interference.”

What this means is that the actual test results show that the majority of the GPS devices upon which tens of millions of Americans rely for navigating their cars, trucks and boats, and finding their location whether traveling in cities or hiking in the wilderness would suffer significant interference.

Similarly, independent government tests found that “GPS loss of function still occurs at unacceptable distances to LightSquared towers” for a variety of the receivers studied. Against these results, LightSquared offers only self-serving assertions in a news release, without any credible, independent support.

2) Even LightSquared admits that operation in the lower MSS band will not solve the interference problem for high precision uses. It fails to note that the harmful interference rate is 94 percent and the critical importance of those high precision users.

LightSquared’s own release states that lower MSS band operations *would* interfere with high precision GPS receivers. It does not reveal that the study group tests show that 94 percent of all high precision receivers tested suffered harmful interference. And just who are the high precision GPS users LightSquared blithely dismisses as just a “limited number”? As detailed farther below, all are in industry sectors vitally important to the U.S. infrastructure and economy: agriculture, aviation, construction, engineering, surveying, marine navigation and disaster monitoring as well as federal, state and local government uses.

LightSquared’s plan to initiate operations in the lower MSS band would immediately create severe disruption to all of these many vital and critically important sectors. A recent economic study found that in the last five years alone, high precision GPS uses accounted for \$10 billion in private investment in GPS equipment, a figure that does not include the many billions of dollars of governmental investment in GPS in its 30 years of existence. The same study estimated that these private uses generated \$30 billion of economic benefits per year.

3) LightSquared’s proposal to “reduce” its permitted operating power actually represents an increase in power above the levels shown to create interference in recent tests.

From the very beginning of the interference testing, LightSquared has stated that it does not seek to use the extremely high 15,850 Watt power level authorized in 2010, but instead to radiate lower aggregate levels of around 1,600 Watts. So, its proposal now to “reduce power” is therefore a classic “sleeves off the vest” offer: a concession that doesn’t actually cost LightSquared anything. All interference testing – and all harmful interference observed in the testing – was conducted at these 1,600 Watts reduced power levels. The new proposal to “reduce” the power limit from the higher 15,850 Watts by 50 percent is actually an *increase* over what was tested, based on LightSquared’s stated intentions, at both the White Sands Missile Range and Las Vegas interference tests. This “reduction” does not provide any additional protection to GPS over what has been tested and proven to cause harmful interference. In fact, the reduction is more likely to be an increase in power over what was tested. At higher power levels than those tested, the interference problems would be even more devastating than those already observed.

4) LightSquared is still proposing to operate in the upper MSS band in the future, despite overwhelming evidence of massive interference and no credible support for any future technical solution.

The proposal is not a change to the frequencies; it simply changes the order in which they would be deployed. Every technical study performed to date shows massive interference to all types of GPS receivers from operation in the upper MSS band. The evidence on this point is overwhelming and there is no credible technical fix available now or projected in the future. The one billion or more times difference in power levels between the intentionally faint GPS

signals and the vastly higher-powered LightSquared signals, as well as the extremely close proximity to GPS spectrum, present fundamental physics issues that LightSquared cannot resolve.

LightSquared has put forward absolutely no credible, independent evidence that there is a technical fix for this interference now or will be in the future. Instead, it has offered up only self-serving predictions. LightSquared should never have even proposed operations in this spectrum in the first place, a proposal that has wasted the time, money and effort of so many companies, individuals, and taxpayer-funded governmental agencies and departments.

CRITICAL HIGH PRECISION USES

Agriculture: Hundreds of thousands of U.S. farmers use high precision GPS to increase crop yields, while reducing the costs and environmental impact of fuel and chemical usage. The United States leads the world in GPS-enabled precision agriculture. The technology enhances the international competitiveness of the U.S. agricultural industry and helps close the gap in global agriculture necessary to feed a growing world population. The Technical Working Group test results show devastating interference to these systems – including in the 10MHz lower block and power levels of the new “solution” – which would severely impact a \$160 billion U.S. industry employing more than half a million people. The National Association of Wheat Growers estimates that its members alone have invested \$3 billion in high precision GPS equipment and estimates of the benefits to the U.S. economy of precision GPS agriculture are in the order of tens of billions of dollars annually.

Aviation: The RTCA aviation report did *not* conclude that the 10 MHz block of frequencies at the lower end of the band adjacent to GPS was free of interference; it only recommended more study in this area. Tests were conducted at the reduced power levels.

Construction, Engineering & Surveying: Hundreds of thousands of users in these industries depend on high precision GPS to precisely guide construction machinery – saving time, fuel costs and improving safety. The same efficiencies are available in the engineering and surveying services industries, which are vital to the construction, land management, energy, oil and gas industries. Billions of dollars have been invested in high precision GPS in these industries, by tens of thousands of companies employing hundreds of thousands of workers. These companies include many small businesses whose owners question whether they will be able to stay in business if high precision GPS is disrupted. From Day One, the new “solution” would cause severe disruption and damage to these vital industries.

Federal, State and Local Governments: High precision GPS is used extensively in the mapping, maintenance and administration of our national assets, critical infrastructure, environment and public lands. High precision GPS users in the U.S. departments of Interior, Defense, Agriculture, Homeland Security and Transportation, as well as state departments of transportation, cities and counties would suffer serious disruption to their work and increased costs as a result of the deployment proposed in the LightSquared “solution,” also from Day One.

Maritime Services: Global Maritime Distress and Safety Systems (GMDSS) built to International Maritime Organization standards suffered complete loss of both GPS and satellite communications during testing of the LightSquared signal, including at the power levels and frequencies proposed in the “solution.” These effects would likely be seen within miles of shore. High precision GPS used in dredging operations to keep U.S. ports, harbors, approaches and navigable rivers both safe and operational would also suffer be serious interference, as would high precision GPS equipment used in near shore marine construction and oil and gas operations. High precision GPS reference stations in coastal areas also provide essential Differential GPS navigation services, and would incur interference as well.

High Precision GPS Networks and Disaster Monitoring: Networks of high precision GPS receivers across the United States provide high precision GPS services to users in a wide range of industries. This includes the use of high precision GPS networks to monitor the movement of dams and other large structures, as well as the movement of earthquake fault zones and volcanoes in the Western U.S. All are designed to automatically raise the alarm in the event of potential disaster. High precision GPS is used to survey and monitor levees across the U.S. to prevent another disaster such as that caused by Hurricane Katrina. GPS networks are also used for precision lane guidance systems that enable snowplows to operate in blizzard conditions or buses to maintain their position in lanes barely wider than the bus itself.