



Coalition to Save Our GPS

Uniting to Protect GPS - A National Utility for More than 30 Years

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The following is a statement issued today by the Coalition to Save Our GPS:

As the House Energy and Commerce Subcommittee on Communications and Technology begins its in-depth examination of spectrum issues, the Coalition to Save Our GPS wanted to highlight for the subcommittee a serious matter involving a recent FCC decision that may disrupt Global Positioning System (GPS) functionality across the nation.

In late January, the FCC's International Bureau, acting with unusual speed and without a vote of the Commissioners, conditionally approved an application for a waiver from a company called LightSquared that, in effect, allows LightSquared to repurpose the satellite spectrum (the "L-Band") immediately adjacent to the Global Positioning System (GPS) for a ground-based system that will use tens of thousands of extremely high-powered transmitters.

The FCC's action has caused serious concern within the GPS industry and user community because LightSquared's planned use of the L-Band is fundamentally different from the "ancillary terrestrial component" of satellite based services that the FCC's rules permit – and, by every indication to date, is incompatible with existing GPS uses. Initial technical analyses have shown that the distant, low-powered GPS signals would receive substantial interference from high-powered, close-proximity transmissions from a network of ground stations.

The consequences of disruption to the GPS signals are far reaching, likely to affect large portions of the population – not just consumers, but Federal, State, and local governments, and a wide variety of commercial GPS users. Therefore, it is imperative that the new system not be deployed unless it can be conclusively guaranteed that the GPS users are fully protected from radio interference.

The Global Positioning System, or GPS, was first launched more than 30 years ago and is now a critical and extremely reliable part of our national infrastructure. Millions of Americans use it routinely every day. The satellites which feed GPS data to the Earth's surface were initially intended for military purposes. Following the 1983 Korean Airlines disaster, President Reagan announced that GPS would be available for civilian purposes and in 1996 President Clinton formalized GPS as a dual-use system, establishing an Interagency GPS Executive Board to manage it as a national asset. In 2004 President Bush updated the policy to include GPS augmentation systems and to encourage foreign development of positioning, navigation and timing systems based on the US GPS system. In 2010, the Obama administration included GPS for the first time in the US National Space Policy. Taxpayers have invested \$35 billion dollars in GPS and its supporting systems to date, and the ongoing government investment is over \$1 billion per year. Investment in critical infrastructure dependent on GPS, including defense, transportation, aviation, and other systems, amounts to many more billions of dollars. The private

sector has also invested many billions of dollars in commercial applications of GPS, and the U.S. has established a technology leadership position in location based technology as a result. Today, GPS is a “crown jewel” national asset, from which every taxpayer benefits through both consumer and professional GPS-equipped devices. Millions of jobs have been created in industries using GPS, and millions more will be created in the years to come.

The Global Positioning System has stimulated a multi-billion dollar global industry that contributes both to the domestic economy and to U.S. exports. However, the Chinese, Russians, and Europeans are all developing their own GPS systems. If the rest of the world concludes that the U.S. system is compromised by interference, those other powers are ready to step forward to assume global leadership in this critical and highly sensitive area.

The FCC’s decision to waive pre-existing restrictions on LightSquared’s ground-based operations provide an object lesson in the risks and pitfalls of spectrum planning that does not take due account of the spectrum band involved and the impact of other users of the band or adjacent bands. The swath of spectrum where GPS satellites transmit, the L Band, has long been reserved for satellite to earth communications of various types. This is a fundamental precept of sound spectrum planning – uses with similar technical characteristics must be grouped together to prevent incompatible uses from undermining effective spectrum use throughout the band.

LightSquared's proposal to build 40,000 terrestrial base stations – again, operating at 1 billion times the power levels of GPS signals as received on Earth – represents a tectonic change in the use of the L- Band. While the GPS community supports efforts to add new broadband competition and free up spectrum for mobile uses, this must be done in the context of rational, long term spectrum planning, rather than the rushed, ad hoc waiver process followed by the FCC to date. Spectrum is a public asset and it should not lightly be handed over at the behest of a private party. More fundamentally, the laws of physics cannot be waived by the FCC. The placement of LightSquared’s high-powered ground-based network in the middle of a satellite band full of weak and distant signals is a recipe for massive interference.

The National Telecommunications and Information Administration (NTIA), which is responsible for coordinating governmental positions on critical spectrum issues, registered the objection of eight federal agencies with the FCC, including the Department of Defense. The NTIA letter states that it received letters from: the Space-Based Positioning Navigation & Timing, National Coordination Office, the Office of the Assistant Secretary of Defense, National Aeronautics and Space Administration, the Office of the Secretary of the Department of Transportation, the Office of the Secretary of the Department of Interior, the Federal Aviation Administration, and the Office of the Manager of the National Communication System raising concerns with the LightSquared proposal.

Advocates for the LightSquared proposal have suggested, misleadingly, that the interference is caused by GPS receivers somehow “listening in” on the L-Band. For the vast majority of receivers, that is simply incorrect. In fact, the potential problem is created by the LightSquared signal, which will be so powerful – up to 1 billion times stronger than a GPS receiver – that it results in “receiver desensitization.” That is the technical term for when a strong off-channel signal overloads a receiver and thus reduces the receiver’s ability to recognize weaker on-channel signals. Other GPS receivers, known as high accuracy receivers and used by high value commercial and government uses, are intentionally designed to “listen in” on the L-Band because licensees of L-Band spectrum provide commercial satellite services which transmits signals that help correct inaccuracies in the GPS signal resulting from atmospheric and other conditions. Those receivers will be highly impacted by LightSquared’s ground-based operations.

Initial tests indicate that each LightSquared ground station will cause varying levels of interference with GPS within miles of the ground stations, and LightSquared plans to build as many as 40,000 such ground stations. If GPS is interfered with, critical private and public sector activity will be adversely affected, including:

- Public Safety:** Public safety depends on GPS technology daily because first responders such as law enforcement, fire fighters, and emergency medical personnel rely on it day-in and day-out to provide critical instant location and route information. Disruptions to the GPS transmission pose a serious threat to public safety.

- Homeland Security:** GPS equipment is widely used by the Departments of Defense, Interior, Transportation, Commerce and Homeland Security. Federal, state, and local government employees rely on GPS equipment in disaster response, public safety, and security and in the management of our national assets and infrastructure, as do emergency services for rapid response, dispatch, and accident investigation.

- Consumers:** Millions of Americans use GPS-enabled consumer devices in their cars and on their cell phones and other hand-held devices as vital, reliable every day navigational tools.

- Aviation:** GPS receivers used in thousands of aircraft could be jammed within miles of LightSquared's transmissions. GPS, together with the Wide Area Augmentation System or WAAS (which will also be affected) has long been approved by the Federal Aviation Administration (FAA) for aircraft navigation and FAA-approved GPS instrument approaches now provide a landing system option at the many U.S. airports not equipped with land-based instrument landing systems. GPS also plays a critical role in the FAA Next Generation Air Transportation System, which will modernize air traffic control and address the nation's need for expanded air traffic capacity without compromising air safety.

- Transportation:** GPS equipment is used in critical asset management activities for our national road and rail infrastructure, improving efficiency, lowering costs and enabling better decision making. The Federal Rail Administration's Positive Train Control mandate further drives the use of GPS to prevent train-to-train collisions, derailments, and casualties or injuries to railway workers. In addition, GPS is used to help fleets lower fuel consumption and improve their carbon footprint. GPS is also used on rivers, inland waterways, coastal areas and ports for navigation, marine construction, dredging, hazard mapping, distress systems and tracking of vessels along with their contents and containers. GPS is vital not only for navigation, but increasingly for port and waterway security.

- Agriculture:** Farmers use GPS to improve efficiency and crop yields, reduce environmental impact and comply with U.S. Agriculture reporting regulations.

- Forestry:** The U.S. Forestry industry and Forest Service use GPS in forest land management and for Forest Automation Systems which improve logging efficiency and reduce environmental harm.

- Engineering and Construction:** The U.S. building, construction, and civil engineering industry - one of the economic sectors most severely impacted by the recent recession - has made large investments in the use of GPS technology to modernize and automate construction sites, machines and processes. GPS is also used to monitor the movement of physical infrastructure such as bridges, dams, mines, and other natural and manmade structures. Disruption to this service could negatively affect these activities.

- Surveying, Mapping, and Land Management:** Interruption of the national geodetic infrastructure would disrupt surveying and mapping activities necessary for land title transactions, land development, building and civil engineering activity, and accident investigations. It would also disrupt the field creation, maintenance, and use of geographic information systems (GIS) databases that underpin our national digital mapping infrastructure.

- Utilities:** Utility services nationwide including electricity, water, gas and telecommunications depend on GPS signals in a number of ways. GPS signals are used to synchronize the power grid. Other uses include synchronizing networks, maintaining and managing infrastructure and coordinating rapid responses to network outages and incidents - activities that are all essential to restoring disrupted services as quickly as possible.

- Natural Resources:** Natural resources industries engaged in the exploration, production and distribution of energy and minerals rely on the GPS service throughout their operations.

- Disaster Management and Scientific Research:** High-accuracy GPS networks are deployed along crustal faults and around volcanoes. In the U.S, the data is used to study and better understand the crustal movements that cause seismic hazards such as earthquakes and volcanic eruptions. In addition to disaster prevention and relief, GPS is also used for weather services and scientific research.

In recognition of the potential interference to GPS receivers, the FCC, as part of its January 26, 2011 modification order, required the establishment of a working group to bring together LightSquared and the GPS community. This working group is in the process of studying the interference concerns, identifying measures to prevent interference and will produce a report for FCC review no later than June 15, 2011. The working group process will be complete once the FCC, in consultation with NTIA, concludes that "the harmful interference concerns have been resolved and sends a letter to LightSquared stating that the process is complete."

The GPS industry is committed to work with LightSquared, FCC, NTIA and other interested parties in this working group process. However, we believe that additional safeguards are needed. We recommend:

1. The FCC must make clear, and the NTIA must ensure, that LightSquared's license modification is contingent on the outcome of the mandated study unequivocally demonstrating that there is no interference to GPS. The study must be comprehensive, objective, and based on correct assumptions about existing GPS uses rather than theoretical possibilities. Given the substantial pre-existing investment in GPS systems and infrastructure, and the critical nature of GPS applications, the results of studies must conclusively demonstrate that there is no risk of interference. If there is conflicting evidence, doubts must be resolved against the LightSquared terrestrial system. The views of LightSquared, as an interested party, are entitled to no special weight in this process.

2. The FCC should make clear that LightSquared and its investors are proceeding at their own risk in advance of the FCC's assessment of the working group's analysis. While this is the FCC's established policy, the Commission's International Bureau failed to make this explicit in its order.

3. Resolution of interference has to be the obligation of LightSquared, not the extensive GPS user community of millions of citizens. LightSquared must bear the costs of preventing interference emanating from their devices, and if there is no way to prevent interference, it should not be permitted to operate. GPS users or providers should not have to bear any of the consequences of LightSquared's actions.

4. This is a matter of critical national interest. There must be a reasonable opportunity for public comment of at least 45 days on the report produced by the working group and further FCC actions on the LightSquared modification order should take place with the approval of a majority of the commissioners, not at the bureau level.

The LightSquared proceeding has already yielded some important lessons. First, major changes in the use of spectrum bands should be directed by Congress or by an FCC rulemaking, not by an ad-hoc waiver process, lacking adequate opportunity for public comment, as in the LightSquared matter. If the FCC intends to change the use of a band, industry needs substantial and clear advance notice of changes in order to make engineering changes to redesign receivers, obtain industry certification for the new receivers and introduce the new receivers into the stream of commerce.

Second, any consideration of a substantial change in spectrum use must entail a robust and timely cost/benefit analysis that weighs the costs imposed upon affected users against the benefits of the new use. In this case, the FCC has proceeded far down the path of authorizing a new use before even beginning to assess the impacts upon, and costs to, a wide swath of government and private users. In doing so, the FCC has sent premature positive signals to the market, and magnified the risk to investors in the proposed new use in the event that the FCC ultimately concludes that the new use should not be permitted on interference grounds.

About the Coalition

The “Coalition to Save Our GPS” is working to resolve a serious threat to the Global Positioning System. The FCC granted a highly unusual conditional waiver for a proposal to build 40,000 ground stations that could cause widespread interference with GPS signals – endangering a national utility on which millions of Americans rely every day.

Members of the Coalition include the Aeronautical Repair Station Association (ARSA), Air Transport Association (ATA), Aircraft Electronics Association (AEA), Aircraft Owners and Pilots Association (AOPA), American Association of State Highway and Transportation Officials (AASHTO), American Car Rental Association (ACRA), American Congress on Surveying and Mapping (ACSM), American Council of Engineering Companies/Council of Professional Surveyors (ACEC/COPS), American Rental Association (ARA), Associated Equipment Distributors (AED), Association of American Geographers, Association of Equipment Manufacturers (AEM), Avidyne Corporation, Boat U.S., Case New Holland, Caterpillar, Council of Professional Surveyors, Deere & Company, Edison Electric Institute (EEI), Equipped to Survive Foundation, Inc. (ETSFI), Esri, Farm Equipment Manufacturers Association (FEMA), Garmin, General Aviation Manufacturers Association (GAMA), Hemisphere GPS, International Air Transport Association (IATA), Intelligent Transportation Society of America (ITS America), Leica Geosystems Inc., Mid-Atlantic Aviation Coalition-New Jersey (MAAC-NJ), National Agricultural Aviation Association (NAAA), National Association of Manufacturers (NAM), National Business Aviation Association (NBAA), National Rural Electric Cooperative Association (NRECA), Networkfleet, OmniSTAR, Orienteering USA, Payment Assurance Technology Association (PATA), PeopleNet, PocketGPSWorld.com Ltd, Regional Airline Association (RAA), TomTom, Topcon Positioning Systems, Trimble and UPS.

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