Testimony of Jim Kirkland, Vice President and General Counsel of Trimble Navigation Limited
March 11, 2011 Hearing of the Commerce, Justice, Science Subcommittee of the
House Appropriations Committee

Mr. Chairman and Members of the Subcommittee, thank you for this opportunity to testify. My testimony does not relate to a funding issue. Rather, I am here to present the committee with information regarding an issue of key importance to the National Telecommunications and Information Administration and all Americans.

Recently, the Federal Communications Commission (FCC) conditionally approved an application for a waiver allowing a company called LightSquared to repurpose the satellite spectrum immediately neighboring that of the Global Positioning System (GPS) for use in extremely high-powered ground-based transmissions. In doing so, the FCC waived its own rules, acting with unusual speed. The section of spectrum at issue is in the L Band 1 (1525 – 1559 MHz) and is immediately adjacent to the GPS section (1559 – 1610 MHz).

The FCC's action has caused serious concern within the GPS industry and user community since this planned use is fundamentally 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 and the federal government. 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 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 GPS was declared by President Clinton to be a dual-use system with an Interagency GPS Executive Board established to manage it as a national asset. Taxpayers have invested billions of dollars in the system over the decades, while the private sector has invested in both civilian and military uses. Today, GPS is a national asset, from which every taxpayer can benefit through both consumer and professional GPS equipped devices. The Global Positioning System has stimulated a multi-billion dollar global industry, and technology leaders such as Trimble contribute both to the domestic economy and to US exports.

The swath of spectrum where GPS satellites transmit, the L Band, has long been reserved for satellite to earth communications of various types. It is fundamental to sound spectrum planning that like uses be grouped together to ensure similarity of technical characteristics and avoid interference. Lightsquared's proposal to build 40,000 terrestrial base stations operating at 1 billion times the power levels of GPS signals as received on earth represents a tectonic change in the use of this band. While the GPS community lauds 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. This is a serious problem with no obvious solution.

Trimble has been a leader in the GPS industry since it first began. My company manufactures and sells commercial use GPS devices and services. You are probably more familiar with consumer companies, such as Garmin, who sell similar devices for individual use. Trimble employs over 4,000 people worldwide and over 2,000 people in the US. Trimble sells many GPS devices to the federal government, to the Department of Defense, the Department of Interior, The Department of Homeland Security, The Department of Transportation and others, including the US Air Force and Air National Guard, US Army, US Army Corps of Engineers, US Marine Corps, US Navy, US Coast Guard, Federal Emergency Management Agency, General Services Administration, National Parks Service, US Forest Service, Natural Resources Conservation Service, The Bureau of Land Management, Bureau of Indian Affairs, US Fish and Wildlife Service, US Environmental Protection Agency, US Geological Survey, Bureau of Reclamation, NASA and NOAA.

The National Telecommunications and Information Administration, which falls under the jurisdiction of this Subcommittee, has a substantial stake in the outcome of this FCC decision. As the Executive Branch representative on telecommunications issues, the NTIA 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.

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.

- 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 impact positive economic and societal improvements.

- 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 will study the interference concerns, identify measures to prevent interference and 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. The study must be comprehensive, objective, and based on correct assumptions about existing GPS uses rather than theoretical possibilities. 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 their investors should not proceed to make any investment in operating facilities prior to a final FCC decision (or at least make it explicit that they do so at their own risk). While this is the FCC's established policy, it failed to make this explicit in its order.

3. Further, the FCC's, and NTIA's, finding that "harmful interference concerns have been resolved" must mean "resolved to the satisfaction of preexisting GPS providers and users."

4. 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.

5. 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.