PROFESSIONAL SURVEYORS CANADA
GÉOMÈTRES PROFESSIONNELS DU CANADA

Professional Surveyors Canada Position Paper June 21, 2011

Re: LightSquared proposal to use land based broadband signal

A potentially serious threat to the usability of the Global Positioning System (GPS) and Global Navigation Satellite System (GNSS) has been identified. This threat comes in the form of a new cell network that is proposed by a company known as LightSquared.

Lab and field tests have shown that the technology that LightSquared proposes to employ will completely stop or at least create unreliable GPS positions. GPS is now a mainstay in a great many facets of private, commercial and safety related aspects of day-to-day life.

Impairing the proper functioning and reliability of GPS will have significant impacts on all current uses of GPS. Because of this Professional Surveyors Canada (PSC) has put together this position paper. Professional Surveyors Canada cannot support the introduction of the new network being proposed and developed by LightSquared at the cost of reliable GNSS / GPS signal.

Who is Professional Surveyors Canada (PSC)?

Conceived, developed, and run by Canadian surveyors, Professional Surveyors Canada is dedicated to building and enabling a strong multi-faceted community of surveying professionals committed to exceeding expectations. One of the pillars of our organization is advocacy for the profession. Through advocacy we endeavour to ensure policy makers, client groups, potential partners and the decision makers in any stakeholder group, have all of the relevant information and are aware of the concerns of Professional Surveyors.

What is LightSquared?

LightSquared Subsidiary LLC is a US satellite telephone services company founded in 1989. In 2001 LightSquared requested permission of FCC to use their satellite frequency band for a combination of satellite and ground based wireless communications. Permission was granted and LightSquared began development of a plan for a wholesale open wireless broadband network across the US in conjunction with Nokkia Seimens Network.

LightSquared proposes to build a 4G-LTE wireless broadband network with up to 40,000 ground based towers plus satellite coverage throughout the United States by 2015. The system operates at a frequency in the 1525 - 1559 MHz band and the ground based transmission stations will produce a very high signal strength.

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The idea is that system users would connect to conventional cellular telephone communication when in range of a ground tower and seamlessly switch to satellite communication when out of range thus eliminating communication outages.

In November 2010 a large satellite providing the orbital component of the LightSquared initiative was launched and system testing has begun.

"LightSquared is currently conducting technical testing which will run through 2011. Once this phase is complete, customers are expected to launch services in the first half 2012." "The nationwide LightSquared network, consisting of approximately 40,000 cellular base stations, will cover 92 percent of the U.S. population by 2015."

Source: lightsquared.com

What are the concerns for Global Navigation Satellite System (GNSS) including Global Positioning System (GPS)?

The concern is that LightSquared is operating on a frequency in the 1525 - 1559 MHz band which is immediately adjacent to GPS L1 band (1559 - 1610 MHz). Also the ground based transmission stations produce a very high signal strength to provide the intended coverage (some sources cite up to 1 billion times stronger as received on earth than the GPS satellite based signal). The strength of signal and proximity to L1 frequency may result in signal from the ground based towers interfering with and overpowering the GPS bands and potentially affect GPS and other GNSS receivers.

Early testing by Garmin and Trimble Navigation is said to have demonstrated that the technology is likely to interfere with GPS and other GNSS receivers.

In recent months it has been reported that testing has shown that LightSquared signals have affected high precision GPS applications by interfering with receivers, including the US Air Force, in New Mexico.

A letter from several Members of Congress to their colleagues, dated May 25, 2011, expresses concern over the American Federal Communications Commission (FCC) conditional waiver granted to LightSquared and calls for the FCC to grant final approval only if it can be demonstrated that there will be no interference with GPS technology.

Source: Recent articles, reports, and letters posted by Coalition to Save Our GPS saveourgps.org

Why does GNSS / GPS matter?

GNSS / GPS is a vital tool for many professionals in the private and public sector including:

- Professionals Surveyors
- Professional Engineers
- Emergency Responders Including 911
- Public Aviation
- The Military
- Planners, Developers and Builders
- Farmers, Foresters, Fishers, Oil and Gas Producers and other Resource Professionals

The precise location capability of professional grade GPS and other GNSS systems allows all of these professionals and others to improve efficiency and accuracy, reduce environmental impact, and provide more and better service to their clients including government, business, and the public.

This means:

- Accurate and affordable boundary information for land owners in all sectors from individual homeowners, to public parks systems, to agricultural producers, to industry;
- Vastly improved efficiency in design, construction and maintenance of public and private infrastructure such as roads, bridges, and utilities;
- Reliable navigation in offshore environments for transportation, resource development, mapping and security;
- Available and reliable data for resource, management, development, and protection;
- Accurate and up-to-date data for emergency response (including 911), security and military applications;
- Safe and reliable location and routing information for the transportation industry in air, on land, and at sea.

For more information on how professional surveying matters from a public interest perspective, please see our web site It's in the Public Interest .

The Professional Surveyors Canada Position:

Professional Surveyors Canada cannot support the introduction of the terrestrial and satellite telecommunications and data signal network being proposed and developed by LightSquared LLC at the cost of reliable GNSS / GPS signal. GNSS / GPS is a vital tool for both the public and the professional surveyor in transportation, property delineation, emergency response, agriculture, land and resource development, and other sectors affecting economic development and the safety and security of the North American public. A reliable GPS signal has become critical in day to day living and must be preserved.

Professional Surveyors Canada encourages stakeholders, including the Canadian federal and provincial governments, to be informed about the issues before the American Federal Communications Commission regarding the LightSquared systems potential to adversely affect GNSS / GPS technology.

Professional Surveyors Canada will endeavour to work with other stakeholders to raise awareness to ensure that the GNSS / GPS is maintained and protected as a vital service to the Canadian and North American public.