I wish to file comments opposing the LightSquared, LLC proposed plan to occupy any 1.5 GHz spectrum which is now occupied by the Global Positioning System (GPS). I am a telecommunications consultant/engineer and FAA licensed Commercial Pilot with significant domestic and global expertise in GPS systems technical performance and ground and air operations. I spent over 25 years constructing and optimizing domestic and global commercial, public safety, and cellular telecommunications systems which were most all GPS supported. For many telecommunications systems, GPS provides site synchronization, inter-site timing, and a high accuracy site frequency standard. Inability to receive GPS signals would cause such telecommunications systems to fail.

I have over 15 years experience in resolving RF interference to domestic and global land-based GPS receiving systems. Some individual RF interference complaints involving land-based GPS receivers have taken days and weeks to resolve, employing extraordinary technical methods such as the installation of inline GPS bandpass filters (with I.F. image notches) or shadowing of GPS antennas to minimize line-of-sight interference from collocated shared site transmitters. These extraordinary GPS interference resolution methods are costly in labor, aftermarket GPS bandpass/reject filter costs, and specialized GPS antenna costs. Where lossy inline GPS filters must be employed or long GPS receiver antenna cables lines must be installed to relocate the GPS antenna from strong near-field energy, an inline RF pre-amplifier must then be installed to makeup antenna system losses, at considerable additional expense. Consumer portable GPS receivers are typically an integral device which do not accommodate add-on filters or improved active antennas in any manner.

GPS receiver interference can occur through several complex relationships, such as in-band and out-of-band strong RF interference from collocated transmitters overloading amplified GPS antennas or swamping the front-end of GPS receivers; from sideband noise created by individual or mixing transmitters at shared radio sites; from GPS amplified antenna brute-force overload; or from shared site transmitter harmonic RF interference.

From my experience with high-performance aircraft GPS systems, it would be highly probable that domestic GPS interference to aircraft GPS systems could occur during enroute flight below 10,000 ft. AGL and certainly for critical instrument approaches below 1000 ft. AGL, particularly in urban areas.

The multitude of potential domestic GPS receiver system interference cases cannot readily be resolved by simply relocating LightSquared's transmitter system to a lower portion of the 1.5 GHz spectrum. Most consumer GPS receivers have a 20 MHz to 40 MHz receiver front-end bandpass that would remain susceptible to any strong in-band, close-proximity signals. A strong 1.5 GHz in-band carrier would also be a likely transmitter mix source when collocated with Low Band (50 MHz to 100 MHz) transmitters for example, with interference products falling directly on GPS receive channels.

The logical solution is for LightSquared to seek new spectrum outside of the 1.5 GHz region, as any domestic GPS interference is unacceptable and high-risk for commercial, military, public safety and aviation guidance systems.

R. Grimes 07/12/11