

CONGRESS MUST ACT IN RESPONSE TO THE FCC'S LIGADO ORDER

On April 22, 2020, the FCC released an Order and Authorization permitting Ligado Networks, LLC ("Ligado") to operate a low-power terrestrial nationwide network in the 1526-1536 MHz, 1627.5-1637.5 MHz, and 1646.5-1656.5 MHz bands.

This decision threatens GPS reliability for millions of Americans who rely on these technologies. Numerous businesses and industry stakeholders expressed their concerns about the FCC's action. And the FCC issued this Order despite concerns raised by federal Agencies that rely on GPS to protect our national and economic security. The Departments of Defense, Commerce, Interior, Justice, Homeland Security, Energy, and Transportation have raised concerns about Ligado's plans, along with NASA, the National Science Foundation, the Coast Guard and the Federal Aviation Administration. These agencies are the GPS experts, as GPS is central to the critical government functions and private sector activities they oversee and support.

The FCC's Process Was Flawed. Most important FCC decisions are made at an open meeting and the draft of those decisions is made public weeks in advance, allowing for review by stakeholders. The FCC failed to do that in this case, circulating a decision only among FCC Commissioners, when major stakeholders are all grappling with the COVID-19 pandemic. The FCC's "stringent conditions" to prevent harmful interference were published for the first time when the Order was adopted and released. Nor did the FCC conduct a rulemaking as part of its consideration of this important issue, as Ligado itself suggested years ago. After nine years, there is no good explanation for this undue haste, other than the fact that Ligado may be facing a second bankruptcy due to the \$4.8 billion in debt that it is carrying.

Ligado's Network Threatens GPS Reliability. Ligado's planned use of the 1526-1536 MHz band, in particular, would be used for downlink (base station to handset) operations, threatening the reception capability of hundreds of millions of GPS devices. Even at the reduced power levels approved by the FCC, the Ligado downlink signal will be 10,000,000 times stronger than GPS satellite signals when they are received on Earth. It is not surprising that many GPS receivers will be overloaded by such strong signals in closely adjacent bands.

Ligado's Network Does Not Advance the Rollout of 5G. Ligado's spectrum is not internationally harmonized for 5G. And preventing Ligado from using its spectrum for 5G to prevent interference to GPS – particularly the most problematic 10 megahertz – will have no impact on the race to 5G. The FCC has already made hundreds of megahertz available for terrestrial broadband and will auction another 350 megahertz in the coming months – over 10 times the amount of spectrum that Ligado holds.

The FCC's Action Does Not Resolve Interference Concerns. In Section 343 of the Communications Act, Congress prohibited the FCC from permitting commercial terrestrial operations in these bands until it "resolves concerns" of interference to GPS devices used by DoD. But as Secretary Esper's letter to FCC Chairman Pai made

clear, those concerns were NOT RESOLVED, meaning the decision fails the requirement of Section 343. And because DoD also uses off-the-shelf GPS devices, the Secretary's concerns extend to millions of GPS units. Instead, of "resolving concerns," the FCC's decision itself admits that there are cases where both Government and private GPS receivers – that power aviation, agriculture and other key industries -- will suffer harmful interference.

The FCC Decision Ignores Findings of Interference by the Expert Agencies Responsible for Maintaining and Protecting Critical GPS Uses. The Commission's decision dismisses technical analysis conducted by industry and government experts that the Ligado network would create interference with many existing GPS receivers. And even more importantly, the Commission disregarded concerns from the Department of Transportation and the Department of Defense, the two agencies responsible for the continued operation of the GPS system and critical applications.

The FCC Relies on Meaningless Evidence. Instead of relying on industry and government experts, the FCC order relies on studies -- funded by Ligado – to assess interference with the GPS signal. The FCC also rests heavily on agreements reached between GPS manufacturers and Ligado. But these agreements, some of which were entered into to end litigation brought by Ligado's predecessor, LightSquared, are all over the map in terms of what parts of Ligado's proposals are supported, while others likely include special deals for the manufacturers involved. Until the complete details of these deals are disclosed, they deserve no weight in deciding whether there will be harmful interference to other GPS receivers. Many key industry stakeholders do not have agreements and continue to object to some or all parts of the Ligado proposals.

The FCC's Decision is Based on a Limited Record. According to recent estimates, there are 900 million GPS receivers in use in the United States, representing tens of thousands of different types of GPS devices used in a huge variety of critical activities. The test results relied upon by the FCC, funded by Ligado, involved a very small subset of GPS device types. The FCC's finding that interference is likely to be limited is at best nothing more than speculation, a giant gamble with the future of GPS.

The FCC Rejects Government Standards for GPS. The most fundamental flaw in the FCC's technical analysis is that it rejected the standard used by the Federal Government stakeholders to determine whether GPS devices would suffer harmful interference: whether a transmitter will increase the amount of "noise" in GPS spectrum by 1dB. The FCC said that this increase in the interference level was "minimal." But it is not – a 1 dB rise in the noise floor equals a 25% increase. But this legal maneuver allowed the FCC to dismiss a predictable and reliable metric that would show that Ligado's proposed operations would create harmful interference to GPS devices. Instead, the FCC relied on a vague definition of harmful interference, and "defined away" mountains of evidence of interference.

Farmers, Small Businesses and Consumers Will Bear the Burden of the FCC's decision. The FCC Order acknowledges that harmful interference will impact Federal

Government GPS users and requires Ligado to upgrade or replace Federal Government devices. But the FCC does not require Ligado to accept responsibility for the millions of private devices that will be affected. While Ligado and its Wall Street backers stand to receive billions of dollars in proceeds from the likely sale of its spectrum, consumers, farmers, pilots, boat owners, surveyors, construction companies, and countless other private GPS users will be forced to suffer interference to their GPS devices or to pay to replace them.

The FCC Has Faulty Analysis on Remediation. While the Commission asserts that remediation (installation of replacement antennas) instead of purchase of new GPS devices is possible for consumers, that solution is not technically feasible in many cases. The FCC knows that the order will cause interference and their proposed remediation to affected users is not in fact possible.

The FCC Expects Consumers to Battle Ligado Over Interference. The FCC requires Ligado to establish and maintain a toll-free number for consumers and businesses to report GPS interference – a toll-free number that Ligado itself will monitor and then “resolve” complaints. Individual consumers and small businesses who suffer interference from the Ligado network will have to battle against whoever owns the network to address interference. The order does not say what happens if Ligado wrongfully denies a complaint of interference. The FCC’s limited enforcement staff will be hard pressed to efficiently resolve disputes.

Ligado and GPS Interference - A Brief History

Since the early 2010s, LightSquared Subsidiary LLC (“LightSquared”), Ligado’s predecessor, has been seeking approval from the FCC to provide a wholesale, nationwide, wireless broadband network integrated with satellite coverage. LightSquared intended to combine its existing satellite communications services with a ground-based 4G-LTE network that would transmit on the same radio band as its satellites. The band is right next to the primary GPS frequency (L1).

GPS Concerns

The GPS community was concerned because testing showed that LightSquared’s ground-based transmissions would overpower the relatively faint GPS L1 signals from space. Although LightSquared would operate in its own authorized band, the band is adjacent to the GPS band, and many GPS devices could pick up the stronger LightSquared signals and become overloaded or saturated. There was concern that millions of existing GPS users could be forced to upgrade their devices and/or accept GPS performance losses to accommodate the new network. The GPS user community includes National Security, federal agencies (DOD, DOT, Interior, USDA, aviation (airlines, pilots, FAA); precision agriculture (Farm Bureau, Soybean farmers, USDA); GPS manufacturers, Construction (surveyors, engineers, equipment dealers, equipment manufacturers, etc.), the financial community, and transportation and logistics (trucking, FedEx, etc.). All of these users rely on precision accuracy of GPS devices.

What was the FCC’s action on the LightSquared network?

In January 2011, the FCC granted conditional authority to LightSquared to operate a mobile broadband network, but the approval was subject to further testing and ensuring that harmful interference to GPS users was addressed. The FCC announced in February 2012 that it was suspending LightSquared’s authorization to provide terrestrial operations due to extensive testing which showed interference with GPS. The FCC solicited public comments, but no final order was issued on the matter.

What is the current status of the LightSquared spectrum?

Since the FCC’s action in 2012, LightSquared (now known as Ligado) has proposed modifications to the use of the spectrum in an effort to gain FCC approval. On April 22, 2020, the FCC released an order permitting Ligado to operate a terrestrial nationwide network even though Ligado has not addressed concerns about GPS interference.