

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

In the Matter of	)	
	)	IB Docket No. 11-109
	)	
Comment Sought on Ligado’s	)	SAT-AMD-20180531-00044
Modification Applications	)	SAT-AMD-20180531-00045
	)	

**THE FREE STATE FOUNDATION\***

**REPLY COMMENTS**

The Free State Foundation respectfully submits these Reply Comments regarding Ligado Networks LLC’s May 31, 2018, amendment to its spectrum license modification applications. Ligado seeks to modify its L-Band spectrum licenses in order to deploy a hybrid terrestrial-satellite network that will deliver “Internet of Things” (IoT) services and likely accelerate the arrival of 5G networks. The primary purpose of these brief reply comments, along with the attached Appendix A incorporated herein containing a recently published Free State Foundation blog, is to urge the Commission to reach a prompt decision on Ligado’s license modification applications.

Ligado’s May 2018 amendment to its modification applications advises the Commission of the latest steps it has taken to safeguard aviation Global Positioning System (GPS) devices from claimed signal interference. This is yet another in a series of steps that Ligado has taken over the last several years to constructively resolve potential interference issues that so far have kept

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\* These reply comments express the views of Randolph J. May, President of the Free State Foundation, and Seth L. Cooper, Senior Fellow. The views expressed do not necessarily represent the views of others associated with the Free State Foundation. The Free State Foundation is an independent, nonpartisan free market-oriented think tank.

valuable L-band spectrum from being put to productive use. The Commission should do all it can to prevent that spectrum from remaining unused. A decision on the merits of Ligado's applications is needed.

There is no gainsaying that the deployment of advanced mobile wireless services like those Ligado proposes should provide substantial public interest benefits. Ligado's proposed satellite/terrestrial mobile hybrid-network is positioned to provide IoT connectivity that can significantly reduce the time and costs of equipment inspections and improve enterprise operational efficiencies. The new network promises to provide "enhanced precision location services" with centimeter-level accuracy for manufacturing and industrial functions. Transportation, energy, electric utility, and public safety industry sectors would be primary users of Ligado's network and other enterprises would benefit as well.

Consumers would indirectly benefit from the efficiencies and innovations enabled by Ligado's network. As explained in the attached Appendix A, "Time for NTIA and FCC to Act on Ligado's Application for Advanced IoT Network," if approved, the new network could help create up to 3 million jobs and contribute up to \$500 billion in value to our nation's economy.

Acceleration of 5G mobile broadband network deployment is another key public benefit likely to occur if Ligado's modified applications are approved. Ligado would be able to repurpose 40 MHz of its licensed spectrum for terrestrial commercial mobile use. That mid-band spectrum could complement low-band spectrum, yielding improved spectrum efficiencies and capacities, and thereby be ideally suited for 5G.

Ligado's ongoing cooperative efforts with federal agencies and major GPS providers to address signal interference include what is in effect a 23 MHz guard band for GPS services. This, Ligado states, it would achieve by relinquishing its terrestrial mobile service authorization for the

spectrum band adjacent to the GPS allocation. Pursuant to its May 2018 amendment, Ligado says it will further reduce downlink power levels to avoid signal interference with certified aviation GPS devices. Additionally, through its amendment Ligado has committed to mitigating potential adverse impact on U.S. government devices. Although Ligado does not expect any such impact in connection with the commencement of operations of its proposed network, it nonetheless has committed to the repair or replacement of such devices as needed.

Ligado's license modification was filed at the Commission back in December 2015. The valuable mid-band spectrum at issue has gone unused since that time, resulting in tremendous lost opportunity cost. Significant progress has since been made to resolve interference claims, including the progress reflected in Ligado's May 2018 amendment. Once NTIA has provided input regarding Ligado's proposed network, the Commission should do all it can to reach a final decision on the application modifications in a timely manner.

Consistent with these reply comments, including the attached Appendix A, the Commission should act on Ligado's amended modification applications as soon as reasonably possible.

Respectfully submitted,

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July 19, 2018

## **Time for NTIA and FCC to Act on Ligado's Application for Advanced IoT Network**

by

**Seth L. Cooper**

[FSF Blog](#), June 13, 2018

NTIA and the FCC have an opportunity to jump-start a new wave of broadband innovation that will boost economic productivity and consumer welfare. On May 31, Ligado Networks filed an [amendment](#) to its application to deploy a hybrid terrestrial-satellite network in the L-Band that will provide “Internet of Things” services and boost America’s position in the global race to 5G. The amendment is aimed at providing protection to certified aviation Global Positioning System (GPS) devices from signal interference by reducing power levels for downlinks to Ligado’s base stations.

In its role as manager of the federal government’s use of spectrum, NTIA is tasked with evaluating Ligado’s application and coordinating the Executive Branch’s response. And the FCC has final approval authority over Ligado’s license application. Each agency should promptly carry out its responsibilities so that a final decision can be made on Ligado’s application.

Since emerging from bankruptcy in 2015, from all indications, Ligado has cooperated with federal agencies in testing technologies and techniques to resolve claimed interference issues. And, it appears that, based on extensive efforts, Ligado has resolved most signal interference issues, or at least reduced their scope. In light of the progress that has been made, NTIA and the FCC should be in a position to make a final decision on Ligado’s application soon. Otherwise, the L-band spectrum will remain unused, resulting in untold billions in lost opportunity costs.

Ligado’s proposed terrestrial-satellite hybrid network is poised to play an indispensable role in the deployment of [advanced IoT networks](#). By providing enterprises real-time communications with connected devices and sensor-embedded equipment, IoT services can enable precision manufacturing as well as heavy industrial operations that require pinpoint accuracy. The proposed service would operate advanced satellite technology in combination with terrestrial mobile technology using L-band spectrum. Due to its propagation characteristics, which includes reliable in-building penetration and cost-efficient widespread geographic coverage, this mid-band spectrum is considered highly suitable for IoT services. If approved, Ligado’s network would cover North America.

Additionally, Ligado’s proposed terrestrial-satellite hybrid network would accelerate 5G mobile broadband deployment. Ligado’s mid-band spectrum is already licensed for mobile-satellite (MSS) use, but it has long gone unused. Ligado seeks modification of its spectrum licenses that

would add a total of 40 MHz of spectrum for terrestrial commercial mobile use. If the Commission permits Ligado's mid-band spectrum to be used for commercial mobile use, that mid-band spectrum would complement low-band spectrum that was repurposed for commercial mobile use pursuant to the Commission's 2017 incentive auction. The potential for commercial ventures that make use of both bands will increase the attractiveness of investment in 5G network infrastructure.

Accenture has [projected](#) that global IoT-related real GDP contributions will total \$10.6 trillion dollars by 2030. A May 2016 [report](#) (PDF page 39 and following) by economist Coleman Bazon projected that Ligado's network would generate between \$250 and \$500 billion in social welfare benefits by relieving growing demand pressure for mobile wireless broadband services. For its part, Ligado has publicly stated its intent to invest \$800 million in satellite and terrestrial network infrastructure, thereby creating approximately 8,000 jobs.

Although the FCC has the ultimate authority to act on Ligado's application, a timely positive evaluation of that application by NTIA, as a practical matter, apparently is a necessary predicate. NTIA is the federal government agency with primary responsibility for spectrum policy. NTIA Administrator David Redl deserves credit for recognizing the need to put L-band spectrum into use in a timely fashion while, at the same time, trying to ensure, to the extent feasible, that government operations in adjacent bands are protected.

In a written answer to questions connected to his March 2017 confirmation hearing, Mr. Redl explained: "Protection of GPS has been, and should be, a priority for NTIA. However, that does not mean that the remainder of the L-band cannot be maximized for other uses." He emphasized the need to coordinate between spectrum users "to best ensure no part of the spectrum goes underused." It is important now for NTIA to do whatever it can so Ligado's application to deploy a hybrid terrestrial-satellite network can be acted on by the FCC.

Ligado has cooperated with federal agencies in testing technologies and addressing potential spectrum signal interference issues with GPS operations. Ligado has also reached agreements with major GPS providers on technical measures to avoid signal interference. For instance, Ligado agreed to establish what is effectively a new 23 MHz guard band for GPS services by relinquishing its terrestrial mobile service authorization for the spectrum band nearest to the GPS allocation. Now, Ligado's May 31 amendment to its application will further reduce downlink power levels to avoid signal interference with certified aviation GPS devices. With all the progress that has been made to date to resolve interference claims, it is incumbent on NTIA and the FCC to act with dispatch now so that Ligado's application can finally be resolved.

Given the tremendous value of the L-band spectrum and the potential economic benefits – potentially in the hundreds of billions of dollars – to be realized from putting it to use, further delay in considering Ligado's hybrid terrestrial-satellite network application is costly. Acting on the application presents an opportunity to further America's advancement in the global race to 5G and to enable next-generation IoT services.