**MYTH vs. FACT – SASC Hearing May 6, 2020**

**PROCESS**

***Myth: There was no public comment process.*** ***(Reed, Inhofe, Deasy, Allen, SASC Hearing)***

**Fact**: There was a robust and extended public comment process. The FCC has been accepting comments for over four years, and was open to submission from any stakeholder during that period. As it does in all similar proceedings, the FCC issued two specific notices asking for comment on the application:

* On April 22, 2016, the FCC posted a [Public Notice](https://ecfsapi.fcc.gov/file/60002089644.pdf) in the Federal Register asking for public comment on Ligado’s proposal. Many comments were filed during the comment cycle but no party submitted a request to deny the application.
* On June 2018, the FCC posted a second [Public Notice](https://licensing.fcc.gov/ibfsweb/ib.page.FetchPN?report_key=1415633) and opened another public comment period.
* Between the two comment periods, various stakeholders and interested parties filed over 100 comments into the FCC’s public docket.

***Myth: The FCC did not go through its rulemaking process.* *(Reed, Inhofe, Shaheen, Deasy, Allen, SASC Hearing)***

**Fact**: The FCC followed the Administrative Procedure Act (“APA”) rulemaking process every step of the way. In 2003, the Commission went through a rulemaking process to promulgate the rules for this spectrum. In processing Ligado’s application submitted in 2015 to modify its license to require dramatically reduced power levels, the FCC scrupulously followed its rules and the process established by the APA. This open and transparent process was closely adhered to, all documents were on the record and available to any interested party, and this proceeding has been widely covered by the media.

***Myth: The FCC made this decision without informing anybody – over the weekend, under the veil of darkness. (Inhofe, SASC Hearing)***

**Facts**: There is nothing about a 4.5-year process that supports the idea of a “rush to judgement.”

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| Dec. 2015 | The application was filed at the Commission |
| April - June/July 2016 | Public comment period 1 |
| June - July 2018 | Public comment period 2 |
| Oct. 2019 | FCC shares draft order with federal agencies, including DoD. |
| Nov. 2019 | DoD sends letter to FCC on Application but submitted no data and referenced DOT Study submitted in May 2018. |
| Dec. 2019 | Pai testifies to Congress that his decision is at the IRAC |
| Jan. 2020 | Pai tells Members of Congress he is working diligently to issue final decision |
| April 2020 | The FCC approves the application |

* After considering all the comments and inputs into the public record over a 17-year period, including the DOT study (which was publicly released on April 26, 2018), the FCC drafted an Order approving Ligado’s application and sent it to federal agencies in mid-October 2019 for review and feedback. (Note: January 2020 [reply correspondence](https://docs.fcc.gov/public/attachments/DOC-361810A1.pdf) from FCC Chairman Pai to an October 28, 2019 letter from Senators Marsha Blackburn and Mark Warner: “Before receiving your letter, I submitted to the Interdepartment Radio Advisory Committee (“IRAC”), headed by the Department of Commerce’s National Telecommunications and Information Administration, a draft FCC decision resolving Ligado’s request.”)
* Immediately after the May 6th hearing, DoD hearing witnesses admitted to the press that they received the draft Order from the FCC in October 2019.
* The FCC circulated the Order approving Ligado’s proposal on Thursday, April 16, 2020. The FCC [announced](https://docs.fcc.gov/public/attachments/DOC-363823A1.pdf) unanimous approval of the Order on Monday, April 20 and publicly released the text of the Order on Wednesday, April 22. As part of its governing process, each Commissioner is allowed to vote at any time after an item is circulated by the FCC Chair. In the case of the Ligado Order, supportive statements made by both [Republican](https://docs.fcc.gov/public/attachments/FCC-20-48A2.pdf) and [Democratic](https://docs.fcc.gov/public/attachments/FCC-20-48A3.pdf) Commissioners focused on the “[thorough](https://docs.fcc.gov/public/attachments/FCC-20-48A2.pdf),” “[painstaking](https://docs.fcc.gov/public/attachments/DOC-363765A1.pdf),” “multi-year” “expert technical analysis” conducted by the agency’s engineering staff and other spectrum experts.

**TESTING**

***Myth: The DOT included an analysis of a 9.8 dBW (10 Watt) transmitter. (Griffin, SASC hearing)***

**Fact**: The DOT test did **not** test Ligado’s amended power levels of 9.8 dBW (10 W), and the DOT Study in the record plainly establishes that DOT did not conduct tests at that amended power level. Instead, DOT tested a power level of 32 dBW, or a power level that is 99% higher than the approved power level. Separate from the DOT testing, it was the FAA that assessed the Ligado proposal and **determined** that a terrestrial power level of 9.8 dBW was the exact level necessary to protect certified aviation devices. The NASCTN study, on the other hand, tested devices at incremental power levels in order to be able to generate data that could assess device performance at different power levels including 9.8 dBW.

***Myth****:* ***The U.S. Air Force submitted its technical study and analysis to the FCC for consideration. (Deasy, SASC Hearing)***

**Fact**: The Air Force did not submit its technical study to the FCC but it did brief the House Armed Services Committee, and based on that briefing the NDAA was amended to enable the FCC to make a decision on this spectrum. Although Air Force testing of military GPS receivers in April 2016 was mentioned publicly several times, the FCC Order explicitly states the **Air Force never submitted the study nor any technical data to the FCC record for consideration**. The only mention of the Air Force test is in aa footnote of a February 14, 2020 Air Force memo to IRAC/NTIA which was communicated to the FCC for the first time via an NTIA letter on April 10, 2020: “These tests, the results of which are classified, supported the conclusions drawn from the DOT testing at WSMR conducted during the same month.” There is no technical data, no results, no information about the test plan -- in short no basis for an agency to engage in reasoned decision-making on the record to respond.

* The [DOT Report](https://www.transportation.gov/sites/dot.gov/files/docs/subdoc/186/dot-gps-adjacent-band-final-reportapril2018.pdf#page=3), released April 26, 2018, in passing noted the “Air Force GPS Directorate conducted testing of military GPS receivers the week prior to the civil receivers being tested (in April of 2016).” Importantly, the FCC Order observed the DOT report “only provided a summary of the data collected in the tests and did not provide the raw data that may have enabled some insight into the variation in the C/N0,” as well as “other significant measurement uncertainties.” (FCC Order ¶53)

***Myth: The NASCTN tests were not conducted in a transparent manner and should not be relied on because they were funded by Ligado. (Allen, SASC Hearing)***

**Facts**: The National Advanced Spectrum and Communications Test Network (“NASCTN”), administered with the oversight of DoD and the Commerce Department, has the mission of providing scientific and unbiased analyses on spectrum matters. In fact, DoD directed Ligado to perform the testing it now claims was not transparent and DoD contractors participated in the testing. Before the test plan was even finalized, the team at NASCTN “received 159 comments from 10 different organizations, including spectrum regulators, federal agencies, GPS manufacturers and the general public. The draft test plan, the revised test plan, and the adjudicated comments from the review process are all publicly available on the NASCTN website.” ([NASCTN Report](https://nvlpubs.nist.gov/nistpubs/TechnicalNotes/NIST.TN.1952.pdf#page=10))

* NASCTN won a [Department of Commerce Gold Medal Award](https://www.nist.gov/nist-awards/2017-gold-medal-award-feldman-genco-janezic-kord-kuester-ladbury-mcgillivray-wunderlich) in 2017 for this breakthrough testing.
* NASCTN is administered by DoD and the Department of Commerce and was established to provide “[accurate, reliable, rigorously scientific, and unbiased measurements and analyses](https://www.nist.gov/ctl/nasctn/about)” in technical spectrum matters. DoD and Commerce maintained an awareness and oversight of the testing, which DoD provided comments to during the process.
* The test plan and design were developed independently by NASCTN without Ligado input and, in fact, [involved the input](https://nvlpubs.nist.gov/nistpubs/TechnicalNotes/NIST.TN.1952.pdf#page=8) of engineers at Fort Huachuca’s Electronic Proving Grounds, “the U.S. Army’s organization for testing command, communications, control, computer, and intelligence systems and equipment including testing of global positioning system (GPS) receivers.”
* Ligado submitted its proposal to testing at NASCTN at the specific request of Fred Moorefield and the DoD’s Chief Information Office, who was part of the DoD contingent at the recent Senate hearing. After NASCTN screens project requests and establishes a test framework that is posted for public input, private entities enter into a Cooperative Research and Development Agreement (CRADA) with NASCTN to administer the testing.

***Myth: The NASCTN testing is invalid because DoD thought it was agreeing to test a primarily satellite-based network, not a terrestrial ground-based solution. The test was on point for what was assumed at the time but is no longer on point in regards to the FCC Order. Ligado moved the goal posts after the tests were conducted. (Deasy, SASC hearing)***

**Facts**: This claim is absurd and has no basis whatsoever in fact. That is crystal clear from the very title of the NASCTN report, page vii of the report, and associated test plan.

* The title of the test is “LTE Impacts on GPS Receivers”. LTE is a technology used by commercial mobile—i.e., terrestrial—devices. It is not possible to read that title and square it with a claim that it was a test of a “satellite-based” network test. It was a test of various spectrum scenarios including Ligado’s proposed network, which has been and remains a combined satellite-terrestrial proposal. That was clear in Ligado’s 2015 FCC Application and it is still true.

* The NASCTN test studied many scenarios including the exact parameters of Ligado proposal to use its spectrum for commercial mobile services deploying LTE. The [Final NASCTN Report](https://nvlpubs.nist.gov/nistpubs/TechnicalNotes/NIST.TN.1952.pdf) explains the purpose of the test was to “(1) develop a test method to investigate the impact of adjacent-band long-term evolution (LTE) signals on global positioning system (GPS) devices that operate in the L1 frequency band, and (2) perform radiated measurements on a representative set of GPS devices to validate the test.” (NASCTN Report at page vii.) That was the test objective from the beginning and it did not change.
* Federal agencies were asked to provide feedback on the test methodology drafted by NASCTN. “In May of 2016, the NASCTN team completed the draft test plan and distributed it to a cross-section of GPS manufacturers, federal agencies, and spectrum regulators to obtain technical feedback on the proposed method. The NASCTN test team reviewed the comments and developed a revised test plan in July of 2016 that addressed the technical issues raised in the comments.” Feedback on NASCTN’s draft test plan included comments from the U.S. Air Force Space Command, U.S. Air Force Spectrum Management Office, DOT, and NTIA. No one submitted comments to the effect that the test plan and Ligado proposal had changed, nor did anyone submit comments to the effect that the NASCTN test was no longer relevant or was invalid.

**HARMFUL INTERFERENCE/1 dB**

***Myth: The FCC Order forces soldiers who can’t get their GPS devices to work in the middle of a warzone to call a 1-800 number to report interference from Ligado’s network. (Reed, Raymond, SASC Hearing)***

**Fact**: This is simply not true. Ligado’s spectrum services will only be used in the Continental U.S., and there is no warzone in the United States so this claim is an incorrect overstatement of the facts.

* The FCC specifically concluded after reviewing all of the data in its record, including the data relied on by the DoD, that Ligado’s proposal would not cause interference to GPS. Thus, the DoD’s continued assertions that all of their GPS capabilities would be harmed is baffling.
* It would be impossible for any GPS device issues experienced by service members in a war zone to be caused by Ligado’s spectrum in the U.S. Such GPS issues in warzones abroad could arise from deliberate jamming or spoofing by hostile actors. That real danger, long known to military planners, explains why so many have urged the military for decades, including a former Secretary of Defense, to develop other technologies and use more robust filters with their GPS devices -- just as Apple phones have for years.

***Myth: The DOT Report proves that the L-band (1-2 GHz) should be reserved for satellite-based uses only because anything causing a 1 dB degradation in GPS receivers would completely disrupt military and civilian GPS uses. (Griffin, SASC Hearing)***

**Facts**: The DOT Report relies on a 1 dB C/N0 metric that “provides no demonstrable evidence of how the functioning of the RNSS receiver is endangered, seriously degraded, or repeatedly interrupted.” (FCC Order ¶59)

* The FCC for decades has had a rule that sets out how it regulates interference and protects radionavigation devices. The Department of Commerce uses an identical rule. And yet the DOT, over the objections of the FCC and the Department of Commerce, decided to conduct a test not based on established rules but instead using this 1 dB metric.

***Myth: 1 dB is the global standard for harmful interference for GPS devices. (Griffin, SASC Hearing)***

**Facts**: 1 dB is not a standard −in the U.S. or internationally. It has never been defined and data from NASCTN and DOT show that every manufacturer detects, measures, and reports a 1 dB change differently. Thus, it is inaccurate to refer to 1 dB as a global standard.

* 1 dB has never been used by the FCC nor NTIA in connection with GPS. The FCC Order is quite clear on this point: “Contrary to the position of those commenters supporting the use of the 1 dB C/N0 degradation metric, the Commission has not applied this metric as the determinant of harmful interference caused by emissions falling within the RNSS allocation [which includes GPS] nor has the Commission used this or any other metric to offer interference protection for GPS receivers that are particularly susceptible to interference substantially outside the RNSS allocation.” (FCC Order ¶50)
* 1 dB has never been used by international spectrum regulators: The FCC Order continues: the ITU (United Nations’ International Telecommunication Union) defines “harmful interference” the same way the FCC does and that the ITU has “*not* recommended” that 1 dB be used to set power levels for GPS services operating outside the bands allocated for GPS. (FCC Order at footnote 194 (emphasis in original).)
* The FCC Order also identifies numerous technical reasons why tests and studies based on 1 dB cannot be used to determine “harmful interference.”
* “1 dB C/N0 degradation metric does not assess whether the actual performance of the GPS devices is affected, and accordingly does not directly address whether there would be any “harmful interference” as defined by the Commission.” (FCC Order ¶48)

**GUARD BAND**

***Myth: The guard band is not big enough.* *(Deasy, Griffin, Raymond, SASC Hearing)***

**Facts**: The 23 MHz guard band separation between Ligado terrestrial operations and the GPS band is one of the largest guard bands ever created to protect adjacent users. Guard bands are typically 2 to 5 MHz, and 23 MHz is roughly the amount of spectrum needed for four TV stations.

* Moreover, a decade ago, the U.S. Air Force assessed its GPS-related spectrum needs and agreed in a formal Memorandum of Understanding with the Department of Commerce’s NTIA (the government agency charged with overseeing government spectrum users) that the Air Force does not need access to any spectrum outside the GPS-allocated spectrum (1559-1610 MHz). In fact, the Air Force and NTIA specifically agreed that GPS receivers were not entitled to protection outside of 1563-1587 MHz – a subset of the GPS-allocated band.

***Myth: The situation Ligado presents is the same as shining a 10-watt bulb down the barrel of the Hubble Space Telescope: it would see nothing and be completely blinded. Alternatively, it’s the same as trying to hear rustling leaves over the noise of 100 jet engines.* *(Griffin, SASC Hearing)***

**Facts**: These analogies fail because they conspicuously ignore an essential fact: the 23 MHz guard band separation between Ligado terrestrial operations and the GPS band. Given this huge separation between Ligado’s operations and GPS, these analogies collapse.

* It would defy physics to assume that a 10-watt light could shine down the barrel of any telescope when the light is essentially 23 miles away.
* Similarly, when jets taking off are 23 miles away from the rustling leaves, the leaves actually are quite audible. Laws of physics tell us that distance in geography and in megahertz reduces substantially the impact any noise. That is precisely what the FCC found -- Ligado’s network is so far away that GPS devices will not be affected in just the same way that a telescope or a person in their yard will not be affected.
* These analogies, which fail to account for a critical reality of Ligado’s terrestrial operations, reveal, to quote Senator Cotton, “the DOD’s demonstration of an exaggerated sense of scientific and technological certitude.”

***Myth: The DoD is not asking for Ligado’s spectrum to be set aside for GPS (Griffin, SASC Hearing)***

**Facts**: At the hearing, DoD said they wanted the whole MSS band to be set aside for use by and the protection of GPS. The DoD acknowledged that the band for which they seek protection goes beyond the band allocated to RNSS (in which GPS is located)—and includes the entirety of the MSS band. But neither DoD nor GPS is authorized to use the entirety of the MSS band; that band includes other lawfully authorized users, including Ligado. Blocking lawful users of the MSS band from using their spectrum consistent with rules established by the FCC 17 years ago in order to give DoD access to more spectrum the FCC determines they do not need would render the entire band commercially worthless, thus would be tantamount to DoD taking that spectrum without due process or just compensation.

**FEDERAL GOVERNMENT POSITION**

***Myth: The federal government unanimously is opposed to the FCC Order. (Inhofe, Deasy, SASC Hearing)***

**Facts**: The Department of State and Department of Justice both issued statements supporting the FCC Order. The five FCC Commissioners on a bipartisan basis voted to approve. And the decision, like all FCC decisions, is now subject to judicial review. In addition, the Departments of State, Agriculture, and Treasury as well as the Veteran’s Administration and United States Postal Service (all of whom are members of the IRAC) did NOT sign the Air Force memorandum which was submitted by the NTIA to the FCC on April 10, 2020.

* [U.S. Attorney General William P. Barr’s](https://www.justice.gov/opa/pr/attorney-general-william-p-barr-s-statement-fcc-chairman-pai-s-draft-order-approve-ligado-s) Statement on FCC Chairman Pai’s Draft Order to Approve Ligado’s Application to Facilitate 5G and Internet of Things Services (April 16, 2020)
* [U.S. Secretary of State Michael R. Pompeo](https://www.state.gov/support-for-5g-and-internet-of-things-development/) Statement: Support for 5G and Internet of Things Development (April 16, 2020)

**LIGADO and 5G**

***Myth: The Ligado proposal and spectrum has nothing to do with repurposing mid-band spectrum, 5G, and competing with China in 5G. (Inhofe, Reed, Griffin, Deasy, Allen, SASC Hearing)***

**Facts**: The two primary competitors to China’s Huawei and ZTE in 5G infrastructure, Nokia and Ericsson, have demonstrated on the record that Ligado’s spectrum can support and enhance the deployment of 5G services.

* Nokia and Ericsson are working with Ligado to support 5G services with features that could improve coverage, capacity, inter-network operability, and lower latency though using Ligado’s spectrum.
* ***Nokia*** studied Ligado’s proposed use of its spectrum as deployed in the FCC Order and found that the “combined use of spectrum in the lower mid-band and higher mid-band categories offers significant economic and operational advantages for 5G as compared to higher mid-band only alternatives.”
* ***Ericsson*** found that using Ligado’s spectrum as deployed in the FCC Order in conjunction with higher-band spectrum would deliver “user experience benefits and performance improvements for 5G as compared to a higher mid-band only deployments . . . [confirming that] multiple technology paths exist to utilize spectrum [to] provide the optimal solution for combined spectrum use for 5G.”