



September 28, 2020

VIA ECFS

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: Written Ex Parte Presentation: IB Docket Nos. 11-109 and 12-340

Dear Ms. Dortch:

Former NASA Administrator Daniel Goldin continues to claim that the Federal Communications Commission's ("Commission") approval of the proposal by Ligado Networks LLC ("Ligado") to repurpose satellite spectrum in the L-Band for high-power terrestrial use should be upheld because it will help advance American leadership in Fifth Generation ("5G") technologies.^{1/} The extremely tenuous linkage between the changes in spectrum use authorized in the *Ligado Order* and the compelling need to advance 5G in this country has been the subject of extensive discussion in the Petitions for Reconsideration and *ex parte* presentations in this proceeding.^{2/} As the GPS Innovation Alliance ("GPSIA") explains in further detail below, Mr. Goldin's broad and unsupported assertions add little to the record. The availability of Ligado's spectrum for terrestrial use will not contribute to the advancement of 5G but will instead undermine U.S. Global Positioning System ("GPS") receivers and devices that are foundational to wireless technology in general, including 5G.

^{1/} See Letter from the Hon. Daniel S. Goldin, NASA Administrator (1992-2001), to Chairman Pai, FCC, IB Docket Nos. 11-109 and 12-340 (filed Sept. 8, 2020) ("Goldin Letter"); *LightSquared Technical Working Group Report, et al.*, Order and Authorization, 35 FCC Rcd 3772 (2020) ("*Ligado Order*").

^{2/} See, e.g., Petition for Reconsideration of Air Line Pilots Association, International, IB Docket Nos. 11-109 and 12-340, at 2 (filed May 20, 2020) ("The public benefit from repurposing this spectrum for non-satellite 5G use is minimal. The amount of spectrum involved is only very small percentage of that required and expected to be available for 5G and does not form part of the Commission's own 5G plan."); Petition for Reconsideration of Iridium Communications Inc., *et al.*, IB Docket Nos. 11-109 and 12-340, at iii, 19-20 (filed May 22, 2020) (noting that the L-Band is not globally harmonized for 5G); Petition for Reconsideration of Lockheed Martin Corporation, IB Docket Nos. 11-109 and 12-340, at 19 (filed May 22, 2020) ("Ligado's proposed IIoT service does not meet any definitions of 5G. Ligado's frequency bands are not part of Commission's 5G FAST Plan, they are not part of 3GPP 5G standards or any other recognized 5G standard, and they are not identified within the ITU for IMT operations.") (internal citations omitted); Letter from Douglas W. Kinkoph, Deputy Assistant Secretary for Communications and Information (Acting), to Ajit Pai, Chairman, FCC, IB Docket No. 11-109 at 2 (filed Dec. 6, 2019) (stating that Ligado's spectrum is not necessary for "the timely deployment of 5G across the United States").

As an initial matter, GPSIA continues to find Mr. Goldin’s ongoing interest in this proceeding curious and hyperbole-fueled. While he was a respected NASA Administrator, Mr. Goldin does not claim any expertise on the core issue of this proceeding – the potential interference to Global Navigation Satellite Systems (“GNSS”) from adjacent-band terrestrial operations. And he certainly cannot claim greater expertise than those Federal agencies that have expressed their views on that matter. Moreover, he references “a team of renowned experts in telecommunications and PNT/GNS,”^{3/} but he has failed to identify the members of that team. Without information about the credentials of those on Mr. Goldin’s team, the Commission cannot assume that Mr. Goldin’s views are informed by individuals with any experience in GNSS engineering principles. Moreover, these engineers may represent companies that have a vested interest in the outcome of the proceeding (*e.g.*, Ligado vendors) or otherwise have interests that would present questions about their independence. In any case, since the underlying analyses that form the basis for the conclusions of these “experts” have not been submitted for the record, they are entitled to no weight whatsoever.

Ligado’s Use of L-Band Spectrum Is Not Critical for 5G Services

The core of Mr. Goldin’s position appears to be that “[t]he Ligado proposal will boost the development of U.S. 5G and [Internet of Things (‘IoT’)] applications while, at the same time protecting GPS.”^{4/} He contends that “[o]nly L-Band (+ C-Band) allows U.S. 5G by 2024”^{5/} and rings the alarm by suggesting that “[i]f the L-Band order is weakened it will give China a win in 5G and enormous economic, technological, military, and geopolitical advantages for decades.”^{6/}

There is simply no credible evidence for Mr. Goldin’s assertions – other than his own previous submissions, which are also unsupported. Winning the race to 5G – against China and other countries – is important, but Ligado’s proposed network is largely **irrelevant to 5G**. Until the *Ligado Order* was released, the Commission itself took this same position. In fact, the “comprehensive strategy to Facilitate America’s Superiority in 5G Technology” (or 5G FAST Plan) introduced by Chairman Pai makes no mention of the L-Band as being necessary or relevant to winning the 5G race or maintaining U.S. leadership on 5G.^{7/}

^{3/} Goldin Letter at 1.

^{4/} *Id.*

^{5/} *Id.* at 2.

^{6/} *Id.* at 1.

^{7/} See *5G FAST Plan*, FCC, <https://www.fcc.gov/5G> (aiming to free up another 2.75 gigahertz of spectrum in the 26 GHz and 42 GHz bands and over 800 megahertz of mid-band spectrum for 5G services, but making no mention of L-Band spectrum) (last visited Sept. 28, 2020); see also *Hearing on “The Trump FCC: Four Years of Lost Opportunities” Before the House Energy and Commerce Comm.*, 106th Cong. (2020), <https://energycommerce.house.gov/committee-activity/hearings/hearing-on-trump-fcc-four-years-of-lost-opportunities> (responding “Yes” when Chairman Pai was asked by Rep. Long whether parties on the panel agree that the C-Band is the best source of prime mid-band spectrum in the United States at this time).

The recent announcements by both the National Telecommunications and Information Administration (“NTIA”) and the Commission regarding the availability of the 3450-3550 MHz band for 5G highlights the difference between the Commission’s *post hoc* attempt to rationalize Ligado’s network as critical to 5G and spectrum that the Commission and others correctly consider 5G.^{8/} As the Commission has pointed out, spectrum in the 3 GHz band is “ideal for next generation wireless services, including 5G,” and reallocation of the 3450-3550 MHz band, in particular, is important because it presents an opportunity to make a large contiguous block of 350 megahertz of mid-band spectrum available for flexible use.^{9/} NTIA has similarly found that making the 3450-3550 MHz band available represents a critical step “necessary to meet U.S. spectrum needs for 5G wireless broadband in mid-band spectrum.”^{10/} While Mr. Goldin recognizes these efforts, he ironically denigrates commercial use of the spectrum by noting that it must be shared with Federal users. He sees sharing of the 3450-3550 MHz band as problematic (even though that sharing will occur in a manner similar to the highly-successful AWS-3 sharing scheme), yet he is blind to the destruction that Ligado’s terrestrial network will cause to the critical national utility that is GPS.

The recent announcement regarding the 3450-3550 MHz band is just the latest evidence that Ligado’s network is irrelevant to winning the race to 5G. As GPSIA previously explained,^{11/} there are several other reasons why Ligado’s network brings nothing to the table. First, the L-Band is only a very small fraction of the spectrum that the Commission has considered to be suitable for 5G. The Commission has made available large swaths of spectrum for 5G services, including 4,950 megahertz of high-band spectrum.^{12/} In addition to the 3450-3550 MHz band, which is expected to be made available in 2021,^{13/} the Commission also recently made, or soon will make, available more than 540 megahertz of mid-band spectrum to support 5G networks. Specifically, the Commission recently concluded an auction of 70 megahertz of licensed spectrum and made available an additional 80 megahertz of licensed-by-rule spectrum in the

^{8/} See *Facilitating Shared Use in the 3400-3550 MHz Band*, Draft Report and Order and Further Notice of Proposed Rulemaking, FCC-CIRC2009-01, ¶¶ 1, 38 (draft rel. Sept. 9, 2020) (“*Draft 3.45-3.55 GHz Order and FNPRM*”) (releasing draft proposals to make 100 megahertz of spectrum in the 3450-3550 MHz band available for flexible-use wireless services); see also Letter from Charles Cooper, Associate Administrator, U.S. Dep’t of Commerce, NTIA, to Ronald T. Repasi, Acting Chief, Office of Engineering and Technology, FCC, and Donald Stockdale, Chief, Wireless Telecommunications Bureau, FCC, WT Docket No. 19-348 (filed Sept. 8, 2020) (“NTIA 3.45-3.55 GHz *Ex Parte* Letter”).

^{9/} *Draft 3.45-3.55 GHz Order and FNPRM* ¶ 3.

^{10/} NTIA 3.45-3.55 GHz *Ex Parte* Letter at 3.

^{11/} See Letter from J. David Grossman, Executive Director, GPS Innovation Alliance, to the Hon. Roger Wicker, Chairman, Senate Committee on Commerce, Science and Transportation, and the Hon. Maria Cantwell, Ranking Member, Senate Committee on Commerce, Science, and Transportation, IB Docket Nos. 11-109 and 12-340 (filed July 21, 2020).

^{12/} See *Expanding Flexible Use in the 3.7-4.2 GHz Band*, Report and Order, Order Proposing Modification, 35 FCC Rcd 2343, ¶ 2 (2020) (“*C-Band Order*”) (explaining that the Commission made available 1,550 megahertz of high-band spectrum in the 24 GHz and 28 GHz bands and 3,400 megahertz of high-band spectrum in the Upper 37 GHz, 39 GHz, and 47 GHz bands).

^{13/} See *Draft 3.45-3.55 GHz Order and FNPRM* ¶ 108 n.172.

3550-3700 MHz (“3.5 GHz”) band to support 5G networks.^{14/} The Commission is also on schedule to commence an auction of 280 megahertz of C-Band spectrum in the 3.7-4.2 GHz band in December 2020.^{15/} Moreover, the Commission is taking steps to make more than 116 megahertz of spectrum available in the 2496-2690 MHz band (“2.5 GHz band”) for commercial services in 2021.^{16/} Ligado’s network, on the other hand, would operate only on spectrum blocks of 10 non-contiguous megahertz – less than one percent of the spectrum being made available for commercial operations and well below what is needed for 5G services in the U.S.

Second, Ligado’s spectrum is not internationally harmonized, significantly diminishing its effectiveness as a 5G band. GSMA, an industry organization representing the interests of mobile network operators worldwide, has emphasized the importance of international harmonization in order to “make the best possible mobile services available for everyone and everything.”^{17/} It also recently recommended that “[r]egulators should aim to make available 80-100 MHz of contiguous spectrum per operator in prime 5G mid-bands (e.g., 3.5 GHz) and around 1 GHz per operator in high-bands (e.g., mmWave spectrum).”^{18/} Yet, Europe, China, Japan, and other major countries deploying 5G services do not identify the L-Band in their mid- or high-band frequencies designated for 5G.

Finally, Ligado’s proposed network simply will not offer a 5G service. Ligado merely proposes to offer limited IoT services, primarily delivered over custom private networks to specific geographic areas for limited vehicular and utility operations. Not only is this not a 5G service offering, but similar services are already being provided by wireless service providers.^{19/}

^{14/} See *Auction of Priority Access Licenses for the 3550-3650 Band; Notice and Filing Requirements, Minimum Opening Bids, Upfront Payments, and Other Procedures for Auction 105; Bidding in Auction 105 Scheduled to Begin June 25, 2020*, Public Notice, 35 FCC Rcd 2140, ¶ 75 n.167 (2020); *Auction of Priority Access Licenses in the 3550-3650 MHz Band Closes; Winning Bidders Announced for Auction 105*, Public Notice, DA 20-1009 (rel. Sept. 2, 2020).

^{15/} See *C-Band Order* ¶ 4; *Auction of Flexible-Use Service Licenses in the 3.7-3.98 GHz Band for Next-Generation Wireless Services; Notice and Filing Requirements, Minimum Opening Bids, Upfront Payments, and Other Procedures for Auction 107; Bidding in Auction 107 Scheduled to Begin December 8, 2020*, Public Notice, 35 FCC Rcd 8404 (2020) (“*C-Band Auction Procedures Public Notice*”).

^{16/} See *Transforming the 2.5 GHz Band*, Report and Order, 34 FCC Rcd 5446, ¶ 3 (2019); *C-Band Auction Procedures Public Notice* at Statement of Chairman Pai.

^{17/} Luciana Camargos, *WRC-19 Strikes a Good Balance, Sets Stage for mmWave 5G*, GSMA (Nov. 25, 2019), <https://www.gsma.com/spectrum/wrc-19-strikes-good-balance-sets-stage-for-mmwave-5g/#:~:text=Striking%20a%20balance%20between%20enabling,and%2040%20GHz%20for%20IMT>.

^{18/} Policy Position Paper, *5G Spectrum Positions Offer a Roadmap for Regulators*, GSMA (Mar. 31, 2020), <https://www.gsma.com/spectrum/resources/5g-spectrum-positions/>.

^{19/} See, e.g., *T-Mobile Launches America’s First Narrowband IoT Asset Tracking Solution* (July 15, 2019), <https://www.t-mobile.com/news/press/beeaware-narrowband-iot-asset-tracking>; Kendra Chamberlain, *Verizon Lights Up Nationwide NB-IoT Network*, FIERCE WIRELESS (May 14, 2019), <https://www.fiercewireless.com/iot/verizon-lights-up-nb-iot-network-across-country>; Chris Penrose, *AT&T Lights Up NB-IoT Network Across the U.S.*, AT&T TECHNOLOGY BLOG (Apr. 29, 2019), https://about.att.com/innovationblog/2019/04/nbiot_network_live.html.

And they are doing so on an ancillary basis, often as an adjunct to 5G services on spectrum they otherwise hold, without interfering with critical services like GPS.

While Mr. Goldin claims that the fastest path to 5G is to couple the L-Band with C-Band spectrum, he simultaneously underestimates the actions that the Commission and the wireless industry are taking to promote 5G networks while overestimating the skills and capabilities of Ligado to deploy the L-Band. As noted above, the Commission has already taken steps, and is expected to take further action, to make actual 5G spectrum available. Major U.S. wireless carriers likewise have already committed substantial resources and are well on their way to deploying that spectrum for 5G services. Indeed, today over 250 million Americans already have access to 5G services from at least one of the Nation's largest wireless providers.^{20/} Mr. Goldin's concerns about the U.S. potentially losing the race to China because Ligado's network may not be used for 5G are therefore simply illogical and alarmist.

Ligado, in contrast, has no track record or clear capabilities to offer advanced 5G services. It takes time and skill to deploy a 5G network. In addition, the ability to do so is often dictated by factors that have nothing to do with which spectrum is used and are sometimes beyond a licensee's control. As Commissioner Carr recently observed, building a new macro tower "typically includes zoning, construction, and electrical permits; city council presentations and public town halls; environmental and historical preservation reviews; negotiation about aesthetics and design – and that's all after a provider has studied demand, engineered the signal, and bought land."^{21/} Although the Commission is modernizing its infrastructure policies and outdated regulations, there is no evidence that Ligado, even without these barriers, has any ability to offer service, and its financial stability is in question.^{22/} L-Band spectrum, and Ligado's use of it, is simply not the "game-changer" Mr. Goldin wishes, and would have the public believe, it to be.^{23/}

^{20/} See *T-Mobile Overtakes AT&T as America's #2 Wireless Provider and Continues to Deliver Industry-Leading Customer Growth with Strong Financial Results in Q2 2020* (Aug. 6, 2020), <https://investor.t-mobile.com/news-and-events/t-mobile-us-press-releases/press-release-details/2020/T-Mobile-Overtakes-ATT-as-Americas-2-Wireless-Provider-and-Continues-to-Deliver-Industry-Leading-Customer-Growth-with-Strong-Financial-Results-in-Q2-2020/default.aspx>; *AT&T Bolster Network with Enhanced Spectrum Position* (Mar. 31, 2020), https://about.att.com/story/2020/spectrum_auction_103.html; *Understanding the 5G Spectrum* (Dec. 13, 2019), <https://www.verizon.com/about/our-company/5g/understanding-5g-spectrum>.

^{21/} *Implementation of State and Local Governments' Obligation to Approve Certain Wireless Facility Modification Requests Under Section 6409(a) of the Spectrum Act of 2012*, Declaratory Ruling and Notice of Proposed Rulemaking, 35 FCC Rcd 5977 (2020) (Statement of Commissioner Brendan Carr).

^{22/} See Alexander Gladstone and Andrew Scurria, *Wireless Venture Ligado in Talks to Restructure Debt*, WALL ST. J. (Sept. 15, 2020), <https://www.wsj.com/articles/wireless-venture-ligado-in-talks-to-restructure-debt-11600176049>.

^{23/} Goldin Letter at 2.

Federal Agencies Are Best Qualified to Assess Harmful Interference to GPS

Mr. Goldin contends that the *Ligado Order* has been “attacked . . . based on the entirely faulty premise of GPS interference.”^{24/} He suggests that input from the Department of Defense (“DoD”) in this proceeding has created an undue “level of influence” and severely “undermine[s] the FCC’s authority.”^{25/} As support, Mr. Goldin points to a letter in which various organizations assert that the Commission “has acquired unparalleled engineering expertise in wireless technologies which has allowed the United States to dominate the global wireless economy for more than two decades.”^{26/}

Mr. Goldin is correct that the Commission is an independent agency and entitled to deference within its areas of expertise. But, as the wording cited by Mr. Goldin concedes, that expertise is in *commercial wireless communications* systems like mobile phones and radio and television broadcasting. It does not extend to engineering principles related to *navigation systems*. The expertise regarding the engineering of navigation systems resides in Federal agencies and the highly innovative GPS industry – precisely the groups whose guidance the Commission rejected. GPS was launched over four decades ago in 1978 by the U.S. Air Force to meet the specific needs of the U.S. military.^{27/} And what is now the U.S. Space Force continues to operate and maintain the GPS system through the Production Corps space vehicles division, a unit within the Space and Missile Systems Center. As Federal agencies launched and continue to oversee the critical sectors of our economy that rely on GPS, they are the ones – not the Commission – that have the deep expertise required to determine whether there will be harmful interference.

Importantly, those relevant Federal agencies that rely on GPS every day to perform their missions determined that Ligado should not be permitted to proceed because its network could cause harmful interference to GPS operations. As GPSIA has explained,^{28/} the Department of Transportation submitted to NTIA thorough analyses, using the appropriate 1 dB degradation in the Carrier-to-Noise Power Density Ratio (“C/N₀”) standard, of the risks of the Ligado proposal to GPS operations.^{29/} It included devices provided by industry *and* the U.S. Government and

^{24/} *Id.* at 1.

^{25/} *Id.*

^{26/} *Id.*; *see also* Letter from Public Knowledge, *et al.*, to Sen. James Inhofe, Chairman, U.S. Senate Committee on Armed Services, and Rep. Adam Smith, Chairman, House Armed Services Committee, *et al.* (2020), <https://www.ccagw.org/sites/default/files/Ligado%20Tech%20Policy%20Community%20Support%20Letter%20PK%20%5BFinal%5D.pdf>.

^{27/} *See* RTI International, *Economic Benefits of the Global Positioning System (GPS)*, at 1-3 (June 2019), https://www.rti.org/sites/default/files/gps_finalreport.pdf.

^{28/} *See* Letter from J. David Grossman, Executive Director, GPS Innovation Alliance, to the Hon. Michael O’Rielly, Commissioner, FCC, IB Docket Nos. 11-109 and 12-340 (filed July 30, 2020).

^{29/} Consistent with the terms of their litigation settlements with Ligado, Garmin International, Inc. (“Garmin”) and Deere & Company (“Deere”) do not affirmatively endorse or oppose the deployment of Ligado’s proposed mobile communications network. Garmin and Deere join in the discussion herein only on the appropriateness of using the 1 dB standard to assess potential interference to GNSS receivers.

was based on testing that occurred at the U.S. Army Research Laboratory – a Federal lab directly under the purview of the military. Those analyses found that substantial numbers of GPS devices will suffer interference in a substantial portion of the coverage area of Ligado’s base station network. That the Commission disregarded the thoughtful analysis of a Federal agency in favor of a private party was not only surprising, but also contrary to past practice. Indeed, the Commission often relies on the findings and recommendations of other agencies when they are the experts on a particular matter.^{30/}

In any case, the Commission’s “independence” does not free it from the obligations under its Memorandum of Understanding (“MOU”) with NTIA. Under the MOU, the Commission and NTIA are required to give each other notice of, and the opportunity to comment on, all proposed actions that could potentially interfere with the other’s spectrum management decisions.^{31/} Congress created this system, in part, to ensure that certain agencies did not improperly elevate their own spectrum needs over others. As Chairman Pallone and Ranking Member Walden recently observed, “[a]s a neutral third party, NTIA is able to take into account the differing missions and needs of federal spectrum users in a manner that will maximize the benefits of spectrum use for the public” and “[a]llowing a single agency that uses spectrum to manage both its and other agencies’ spectrum would risk inefficient use of this precious resource.”^{32/}

Mr. Goldin’s concerns about “veto power” by the DoD and inability of the Commission to lead are particularly misplaced.^{33/} The Commission’s recent proposal with respect to the 3450-3550 MHz band demonstrates just the opposite. It presents a prime example of Federal agencies – specifically the Commission and DoD – working together harmoniously for the greater good. Even Mr. Goldin acknowledges those efforts as “a positive step.”^{34/}

^{30/} See, e.g., *Applications of T-Mobile US, Inc., and Sprint Corporation*, Memorandum Opinion and Order, Declaratory Ruling, and Order of Proposed Modification, 34 FCC Rcd 10578, ¶¶ 33-36 (2019) (declining to approve the Sprint/T-Mobile merger until after the Department of Justice – the agency responsible for reviewing the antitrust effects of telecommunications mergers – reached a satisfactory settlement); *Proposed Changes in the Commission’s Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields*, Resolution of Notice of Inquiry, Second Report and Order, Notice of Proposed Rulemaking, and Memorandum Opinion and Order, 34 FCC Rcd 11687, ¶ 2 (2019) (deferring to the findings of the Food and Drug Administration that cell phones do not cause health problems, noting that it is the “expert agency regarding the health impacts of consumer products”).

^{31/} See Memorandum of Understanding between the Federal Communications Commission and the National Telecommunications and Information Administration (Jan. 31, 2003), <https://docs.fcc.gov/public/attachments/DOC-230835A2.pdf>.

^{32/} Letter from Frank Pallone, Jr., Chairman, House Committee on Energy and Commerce, and Greg Walden, Ranking Member, House Committee on Energy and Commerce, to the Hon. Gene L. Dodaro, Comptroller General of the United States, U.S. Government Accountability Office (Jan. 24, 2020), https://republicans-energycommerce.house.gov/wp-content/uploads/2020/01/GAO.1.24.2020.-Letter-re-GAO-NTIA-Spectrum-Management-Letter.CAT_.pdf.

^{33/} See Goldin Letter at 1.

^{34/} See *id.* at 2.

Finally, Mr. Goldin claims that he is independent and has no financial interest in the matter.^{35/} GPSIA remains skeptical,^{36/} particularly in view of his unwillingness to reveal his “team.” Mr. Goldin merely repeats Ligado’s discredited assertions to demonstrate third-party support. But his claims, like Ligado’s, remain conclusory, unsupported in the record, and/or just plain wrong. They should be seen for what they are – failed attempts to obfuscate the flaws in the *Ligado Order* and distract from the fact that Ligado’s network, as confirmed by the relevant Federal experts, would cause harmful interference to GPS.

* * *

Pursuant to Section 1.1206(b)(2) of the Commission’s rules, an electronic copy of this letter is being filed in the above-referenced dockets. Please direct any questions regarding this filing to the undersigned.

Sincerely,

/s/ J. David Grossman

J. David Grossman
Executive Director
GPS Innovation Alliance

^{35/} See *id.* at 1 (stating he has “no compensation and no affiliation with Ligado”).

^{36/} Mr. Goldin may have an undisclosed indirect financial or other interest in the outcome of the Ligado proceeding because he is a director of a U.S. subsidiary of Nokia, which is a vendor to Ligado and which has supported Ligado’s applications at the FCC. Nokia will receive increased business as a result of the FCC’s decision, and if Mr. Goldin owns any stock in Nokia as a result of his director position or otherwise, he stands to benefit as well. See Bloomberg, Nokia of America Corp, Board Members, <https://www.bloomberg.com/profile/company/LU:US> (last visited Sept. 21, 2020). Mr. Goldin has also collaborated with Nokia’s former CTO on a white paper that has reportedly been used in support of a private equity firm proposal for the U.S. government to invest in Nokia to improve its ability to invest in 5G technology, all to the potential benefit of Mr. Goldin. See Drew FitzGerald and Sarah Krouse, *White House Considers Broad Federal Intervention to Secure 5G Future*, WALL ST. J. (June, 25, 2020), <https://www.wsj.com/articles/white-house-federal-intervention-5g-huawei-china-nokia-trump-cisco-11593099054>.