



May 2, 2019

The Honorable Patrick M. Shanahan  
Acting Secretary of Defense  
1000 Defense Pentagon  
Washington, DC 20301-1000

**Re:     *Response to Defense Innovation Board 5G Report***

Dear Mr. Secretary:

5G wireless technologies will be transformational for U.S. consumers, virtually every U.S. industry, and certainly the U.S. military. On behalf of the wireless industry, CTIA<sup>1</sup> is eager to continue the industry's history of constructive engagement with the Department of Defense ("Department" or "DoD"), especially as you examine the potential of 5G to meet military needs.

The United States seized global leadership in 4G by making key spectrum bands available and unleashing private sector investment. President Trump recently recognized that we should execute on the same strategic approach here – "private sector-driven and private sector-led" – to ensure the U.S. leads the world in all aspects of 5G development and deployment.<sup>2</sup> We appreciate the embrace of this approach by your senior staff, who have likewise rejected nationalization proposals and similar alternatives that would discourage the very investment on which our nation's wireless success has been built.

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<sup>1</sup> CTIA – The Wireless Association® ("CTIA") ([www.ctia.org](http://www.ctia.org)) represents the U.S. wireless communications industry and the companies throughout the mobile ecosystem that enable Americans to lead a 21st century connected life. The association's members include wireless carriers, device manufacturers, suppliers as well as apps and content companies. CTIA vigorously advocates at all levels of government for policies that foster continued wireless innovation and investment. The association also coordinates the industry's voluntary best practices, hosts educational events that promote the wireless industry and co-produces the industry's leading wireless tradeshow. CTIA was founded in 1984 and is based in Washington, D.C.

<sup>2</sup> See Margaret Harding McGill, *Trump Rejects Government Intervention in 5G Wireless Networks*, Politico (Apr. 12, 2019), <https://www.politico.com/story/2019/04/12/trump-government-intervention-5g-wireless-networks-1352763>.



We also appreciate the Department's recognition that, in the case of 5G, success will require an "all of the above" approach to low-, mid- and high-band spectrum. 5G has been optimized to use all three types of spectrum in conjunction with one another. Thus, prioritizing one type of spectrum over another would constrain 5G and deny U.S. consumers, industries, and the military the full potential of 5G.

The recent report on 5G by the Defense Innovation Board ("DIB") was, however, a missed opportunity to collaborate, and the apparent lack of outreach to the U.S. wireless industry resulted in a flawed and ultimately inaccurate view of 5G technology, 5G deployments, and public policies to foster the rapid, widespread rollout of 5G.<sup>3</sup> As the organization representing the industry that has already spent billions of dollars on 5G and is in the process of spending billions more, we feel compelled to send you this letter to correct the record and highlight critical information that was not reflected in the DIB report.

We do agree with the DIB report that the U.S. needs to make more mid-band spectrum available for 5G, and the FCC and the Administration agree on that point as well; but the DIB report: (1) misunderstands how 5G technology has been designed and will operate; (2) devalues the importance of high-band (*i.e.*, millimeter wave, or "mmWave") spectrum for 5G; (3) wrongly prioritizes sharing over exclusive-use licensed spectrum; and (4) fails to accurately reflect the U.S. commercial industry's standing in the race to 5G. We would welcome the opportunity to work with DoD on all of these aspects of 5G technology and deployment and to identify win-win opportunities for the military and the U.S. wireless industry.

***The U.S. should not surrender its leadership in high-band spectrum – and the technological prowess that comes with that leadership – to "pivot" to mid-band exclusively.***

The DIB's suggestion that the U.S. is building 5G with the wrong spectrum, or is an "island" with respect to high-band spectrum, is incorrect both technically and factually. Thanks to U.S. Government action, the U.S. leads the world in availability of mmWave/high-band spectrum –

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<sup>3</sup> Defense Innovation Board, *The 5G Ecosystem: Risks & Opportunities for DoD* (April 2019) ("DIB 5G Report"). The failure to include any author experts from the wireless industry or coordinate with the U.S. wireless industry led to a number of avoidable errors and misstatements that both undercuts the validity of the report and the effectiveness of its advice to DoD. Further, in some cases the DIB's report authors seemingly advanced their own companies' policy prescriptions, without acknowledgement.



spectrum that offers unique characteristics to unlock 5G's faster data rates, densified connections, and reduced latency, using wider channels that will deliver capacity on a scale not seen before in the mobile wireless industry.<sup>4</sup> In short, high-band spectrum used for 5G will enable consumers, businesses, and the military to enjoy the type of connectivity one can only dream about today—multi-gigabit data rates, latency of just a few milliseconds, and more. High-band spectrum will enable U.S. operators to deliver far faster 5G connectivity than can be delivered in mid or low bands standing alone. However, to reach the full potential of 5G, we need all three types of spectrum—low-, mid-, and high-band. Each offers particular advantages over the other two, and deploying 5G using all three is the best approach, which is why it is the approach that all of the U.S. carriers are taking.

Far from a weakness, high-band spectrum is a strength of our nation's 5G preparedness. The U.S. has already auctioned or assigned 2,500 megahertz of high-band spectrum for licensed 5G use, with another 3,000 megahertz to be released beginning later this year. This early access to high-band spectrum has allowed the U.S. wireless industry to launch the first commercial 5G services anywhere in the globe, confirming the wisdom of America's leadership in high-band spectrum.

The fact that South Korea, China, and many other countries<sup>5</sup> are working to catch up to the U.S. by freeing up high-band spectrum underscores its importance to 5G and the flawed analysis in the DIB report. South Korea is assigning 2,400 megahertz of mmWave spectrum to 5G, China intends to make 2,000 megahertz available per operator, and Japan is allocating four 400-megahertz mmWave blocks.<sup>6</sup>

Without question, the wireless industry agrees with the finding that the U.S. needs additional mid-band spectrum for 5G over and above the 2.5 GHz and 3.5 GHz bands, but these efforts should not come at the expense of continued actions to maintain U.S. global leadership in high-band spectrum. The report ultimately offers a false choice and is wrong to suggest that U.S. efforts to free up high-

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<sup>4</sup> CTIA, *The Global Race to 5G – Spring 2019 Update*, at 3 (Spring 2019) ("CTIA 5G Update"), <https://api.ctia.org/wp-content/uploads/2019/04/The-Global-Race-to-5G-Spring-2019-Update.pdf>.

<sup>5</sup> See *id.*, Figure 4.17 at 40.

<sup>6</sup> David Abecassis *et al.*, *Global Race to 5G – Update*, Analysys Mason, at 28, 36-37, 69-71 (Apr. 2019) ("Analysys Mason 5G Update"), <https://api.ctia.org/wp-content/uploads/2019/03/Global-Race-to-5G-Update.pdf>.



band spectrum are misplaced. The U.S. needs a mix of all different complementary spectrum bands, as the “5G Fast Plan” launched by FCC Chairman Ajit Pai makes clear.<sup>7</sup>

As Chairman Pai has explained, America must “pursu[e] an all-of-the above approach, looking at opportunities in low, mid, and high bands.”<sup>8</sup> He’s right. ***There is a clear roadmap to make mid bands available for 5G, which the report largely ignores.*** The Report is correct that mid-band spectrum is critical to 5G due to its combination of high capacity and ability to cover large geographic areas, and that other countries plan to make over four times more licensed mid-band spectrum available than the United States by 2020.<sup>9</sup> Addressing this is important, and we welcome DoD engagement. While the Report identifies the importance of mid-band, it fails to acknowledge that policymakers are taking steps to free up blocks of mid-band spectrum:

First, the FCC should fast track its existing 3.7-4.2 GHz band review, maximizing the amount of spectrum made available promptly for mobile broadband use.<sup>10</sup>

Second, Chairman Pai has recently announced that the FCC will auction Priority Access Licenses in the 3.5 GHz band in 2020, and the FCC should set a date for that auction soon.

Third, NTIA, with DoD participation, should continue its review of the 3.45-3.55 GHz band to identify opportunities to allow commercial wireless use of the band without impacting federal agency operations.

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<sup>7</sup> FCC, The FCC’s 5G FAST Plan, <https://www.fcc.gov/5G> (last visited Apr. 26, 2019). CTIA commends the FCC for its leading efforts on making spectrum available for 5G, as well as its work on infrastructure siting reform and modernizing outdated regulations.

<sup>8</sup> FCC Chairman Ajit Pai, Remarks at the Mobile World Congress Latin American Dialogue Roundtable, Barcelona, Spain, at 1 (Feb. 27, 2019), <https://docs.fcc.gov/public/attachments/DOC-356374A2.pdf>.

<sup>9</sup> CTIA 5G Update at 4.

<sup>10</sup> The FCC’s 3.7GHz proceeding is critical to U.S. mid-band policy, and the FCC should move to release hundreds of megahertz for 5G as quickly as possible. Yet the report seems to undermine those efforts by only calling for the adoption of new “fixed operations” in the band and ignoring that the wireless industry is focused on the band for 5G mobility. This likely reflects the contributions of DIB members, including Google and Microsoft executives, whose companies support the fixed deployment proposal for the band. See, e.g., Comments of Google LLC, GN Dkt. 18-122 (Oct. 29, 2018); Comments of Microsoft Corporation, GN Dkt. 18-122 (Oct. 29, 2018).



Finally, the FCC should adopt a Further Notice of Proposed Rulemaking to examine the possibility of repurposing the upper portion of the 6 GHz band for exclusive-use, flexible rights licensed services.<sup>11</sup>

By taking all of these steps, the U.S. will assume a leading role in the global mid-band ecosystem.

***There may be ways to share certain federal bands to enable 5G, but the objective should be making available spectrum for exclusive, licensed terrestrial use to support next-generation connectivity as soon as possible and as broadly as possible.*** Exclusive-use licenses have long been the cornerstone of the United States' successful wireless strategy, and they form the backbone of our mobile networks today. They provide licensees with the certainty and predictability needed to invest and to ensure their investments will be protected against harmful interference. U.S. global leadership in 4G was built on exclusive-use spectrum, which generated massive investment by the private sector – \$226 billion in infrastructure and \$114 billion in spectrum auction bids.<sup>12</sup> A similar private-sector led effort should drive the deployment of 5G networks, facilitated by smart wireless policymaking to free up additional licensed, exclusive-use spectrum. The report's failure to account for this critical need is yet another major flaw.

Exclusive-use spectrum can be achieved through a variety of proven mechanisms that involve varied ways of sharing. These include splitting a federal band into federal and non-federal allocations; clearing current non-federal bands for new uses and relocating non-interfering commercial operations into federal bands; or introducing commercial operations into a federal band by creating exclusion or protection zones around limited federal operations. And federal law provides that any upgrades to federal systems or relocation costs incurred in order to free up exclusive use spectrum using these approaches can be paid for with the proceeds from FCC spectrum auctions.<sup>13</sup> While the DIB report cites the 3.5 GHz Citizens Broadband Radio Service ("CBRS") sharing model as a "successful" sharing precedent, and CTIA has worked hard to make the CBRS band a reality, its

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<sup>11</sup> See generally CTIA, *A National Strategy to Lead in 5G*, at 6-7 (2019), <https://api.ctia.org/wp-content/uploads/2019/04/A-National-Spectrum-Strategy-to-Lead-in-5G.pdf>.

<sup>12</sup> See *id.* at 5; see also Recon Analytics, *How America's 4G Leadership Propelled the U.S. Economy* (Apr. 16, 2018), <https://api.ctia.org/wp-content/uploads/2018/04/Recon-Analytics-How-Americas-4G-Leadership-Propelled-US-Economy-2018.pdf>.

<sup>13</sup> See 47 U.S.C. § 928.



experimental three-tiered sharing approach – like other dynamic sharing proposals – has yet to be launched commercially and cannot yet be held up as the model to be applied to other federal bands. Embracing such experimental approaches would threaten the U.S.’s standing relative to the rest of the world, where exclusive-use licensing remains the predominant allocation strategy.

***Finally, the report is wrong to conclude that the U.S. is “not likely” to be the world leader in 5G – America already leads in 5G industry readiness.*** The United States leads the world in commercial 5G deployments and, together with China, leads the world in overall global 5G readiness, according to a 2019 report just released by Analysys Mason (and contrary to the DIB report’s suggestion that the United States is behind).<sup>14</sup> The 2019 report finds that that the U.S. has made impressive strides in the race to 5G over the past year largely due to smart policies that unlocked the power of free-market competition – the release of mmWave spectrum, the reform of infrastructure siting regulation by the FCC, and significant industry investment in 5G development and deployments.

5G-readiness metrics confirm U.S. leadership in 5G. First, America now leads the world with the most commercial 5G deployments of any nation – 92 by the end of 2019, compared to 48 by its next closest competitor (South Korea).<sup>15</sup> All four U.S. nationwide carriers will be providing 5G services by mid-2019. Cisco projects that by 2022, North American will have the highest share of connections on 5G at nine percent, compared to just four percent in Asia.<sup>16</sup> By 2024, nearly half of the mobile subscriptions in North America are expected to be 5G.<sup>17</sup> America is also an investment leader, with the wireless industry expected to invest \$275 billion over seven years to deploy 5G networks – creating three million new jobs and adding \$500 billion to our economy.<sup>18</sup> Of course, there remains more work to be done.

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<sup>14</sup> Analysys Mason 5G Update, *supra*. This updated report supersedes the outdated 2018 Analysys Mason report cited by DIB in its report.

<sup>15</sup> CTIA 5G Update at 2.

<sup>16</sup> Cisco, *Visual Networking Index*, at 14 (Feb. 2019) <https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white-paper-c11-738429.pdf>.

<sup>17</sup> Ericsson, *Ericsson Mobility Report*, at 6, 13 (Nov. 2018), <https://www.ericsson.com/assets/local/mobility-report/documents/2018/ericsson-mobility-report-november-2018.pdf>.

<sup>18</sup> CTIA, *The Global Race to 5G*, at 2 (April 2018), <https://api.ctia.org/wp-content/uploads/2018/04/Race-to-5G-Report.pdf>.



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CTIA looks forward to our continued engagement with DoD on these issues, as we all work together to win the race to 5G and maintain U.S. global leadership in all things wireless.

Please do not hesitate to contact the undersigned with any questions.

Sincerely,

Thomas C. Power  
Senior Vice President and General Counsel

cc: Dr. Michael D. Griffin, Under Secretary of Defense for Research and Economics  
Dana Deasy, Chief Information Officer, DoD  
J.D. Crouch, Chairman, Defense Policy Board, DoD

