

**Before the
NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION
Washington, DC 20230**

In the Matter of)	
)	Docket No. 200521-0144
National Strategy to Secure 5G)	RIN 0660-XC047
Implementation Plan)	

COMMENTS OF T-MOBILE USA, INC.

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T-Mobile USA, Inc. (“T-Mobile”)^{1/} submits these comments in response to the Notice and Request for Comments issued by the National Telecommunications Information Administration (“NTIA”) in the above-referenced proceeding, soliciting input on an implementation plan to ensure the security of next-generation wireless communications systems and infrastructure.^{2/} T-Mobile supports these efforts intended to facilitate the secure and rapid deployment of the fifth-generation (“5G”) wireless technologies that will be a critical economic force as the Nation emerges from the current pandemic. While industry has and will continue to take the lead in developing and deploying secure 5G systems, there are several important steps the U.S. Government can take in parallel to further ensure America’s leadership in 5G communications services and equipment.

^{1/} T-Mobile USA, Inc. is a wholly-owned subsidiary of T-Mobile US, Inc., a publicly traded company. T-Mobile and Sprint are now one company operating under the name T-Mobile. The merger closed on April 1, 2020.

^{2/} See *The National Strategy to Secure 5G Implementation Plan*, Notice; Request for Comments, 85 Fed. Reg. 32016 (2020) (“*Request for Comments*”); *The National Strategy to Secure 5G Implementation Plan*, Notice; Extension of Comment Period, 85 Fed. Reg. 36383 (2020) (extending the comment deadline to June 25, 2020); see also Secure 5G and Beyond Act of 2020, Pub. L. 116-129, 134 Stat. 223 (“Secure 5G and Beyond Act”).

I. INTRODUCTION AND SUMMARY

The continuing deployment of 5G wireless technologies and networks will be key economic drivers and significant components of the Nation's future prosperity. As highlighted in the National Strategy to Secure 5G of the United States of America, "[t]his new technology will provide consumers, businesses, and governments with remarkably fast network connections that will enable tens of billions of new devices to harness the power of the Internet, transforming the way we live, work, learn, and communicate."^{3/} That is why it is important that, where the U.S. Government controls assets and processes critical to the deployment of secure and reliable 5G services and infrastructure, it does all that it is able to facilitate that deployment. In particular, the U.S. Government must ensure that service providers have a sufficient supply of high-, mid-, and low-band spectrum for exclusive licensed commercial use. It must also streamline tower and antenna siting policies so that 5G networks can be deployed rapidly and with sufficient capacity.

To further foster the creation of a 5G ecosystem of technologies, devices, and networks, the U.S. Government should also support research, development, and testing by trusted vendors. Many domestic wireless service providers and equipment manufacturers are already actively engaged in research, development, and testing activities. But they are also increasingly faced with competition by foreign entities that are heavily subsidized by their home countries, tilting the global marketplace in their favor and squeezing out both established providers and suppliers that have a demonstrated reputation of reliability and trustworthiness, and potential new competitors. The U.S. Government can help level the playing field by developing grant

^{3/} See National Strategy to Secure 5G of the United States of America (Mar. 2020), <https://www.whitehouse.gov/wp-content/uploads/2020/03/National-Strategy-5G-Final.pdf>.

programs, providing loans, and creating tax incentives that will support trusted vendors and strengthen their ability to compete.

Not only will supporting trusted vendors produce a competitive global wireless marketplace, but it will also promote the security and reliability of 5G networks. Efforts are already underway by trusted vendors and other industry stakeholders to develop and implement security measures for 5G networks. The U.S. Government should continue to support those efforts by maintaining technology-neutral policies and establishing clear criteria for determining trusted vendors.

Finally, a U.S. Government domestic regulatory and policy environment that promotes the deployment of 5G will also ensure that the U.S. maintains its leadership in the race to 5G and realizes the economic benefits of winning that race – as it did with previous generations of wireless networks. The U.S. Government must also maintain its strong participation, in collaboration with industry, in international venues to promote the Nation’s interests, support responsible global development of 5G, and mitigate against harms and risk posed by other countries. The U.S. is poised to continue to be at the forefront of 5G rollout, and the U.S. Government should seize this unique opportunity by providing sufficient support to the providers and suppliers that are critical to that success.

II. U.S. GOVERNMENT FACILITATION OF 5G ROLLOUT

A. Government Can Help Facilitate Secure 5G Deployment

NTIA seeks comment on how the U.S. Government can best support the domestic development and deployment of 5G.^{4/} The United States has the world’s most developed

^{4/} See *Request for Comments* at 32017.

wireless networks because system deployment and technology evolution has been driven by competition rather than government mandate. Indeed, T-Mobile's merger with Sprint^{5/} is the best evidence of how private industry can promote secure 5G networks. The transaction has allowed T-Mobile access to the necessary spectrum and network assets to deploy a globally leading nationwide 5G network with deep and robust capacity and reach. As a result of the transaction, T-Mobile was able to commit to cover 99 percent of the total U.S. population and 90 percent of the U.S. rural population with 5G download speeds of at least 50 Mbps within six years and to provide 5G service with at least 100 Mbps to 90 percent of the overall U.S. population and two-thirds of the rural population.^{6/}

T-Mobile's investments in the network will create a virtuous cycle that will facilitate the development of a secure 5G ecosystem and help ensure that U.S. companies are poised to compete globally. T-Mobile will rely on trusted vendors to deploy its network, providing business opportunities that will help those companies thrive both domestically and internationally. T-Mobile's commitments and its deployment using secure 5G network components will help drive secure 5G supply chain development and success and is the type of

^{5/} See *Applications of T-Mobile US, Inc., and Sprint Corporation For Consent To Transfer Control of Licenses and Authorizations; et al.*, Memorandum Opinion and Order, Declaratory Ruling, Order Proposing Modification, 34 FCC Rcd 10578 (2020) ("*T-Mobile Merger Order*"); Press Release, *Justice Department Settles with T-Mobile and Sprint in Their Proposed Merger by Requiring a Package of Divestitures to Dish*, U.S. Dept. of Justice (July 26, 2019), <https://www.justice.gov/opa/pr/justice-department-settles-t-mobile-and-sprint-their-proposed-merger-requiring-package>; see also News Release, *T-Mobile Completes Merger with Sprint to Create the New T-Mobile*, T-Mobile (Apr. 1, 2020), <https://www.t-mobile.com/news/t-mobile-sprint-one-company>.

^{6/} See *T-Mobile Merger Order* ¶¶ 26-27. Within three years, T-Mobile would provide 5G service with download speeds of at least 50 Mbps to 75 percent of the total U.S. population and two-thirds of the rural population and 5G service with download speeds of at least 100 Mbps to 63 percent of the total U.S. population and 55 percent of the rural population.

industry-driven, competitive approach that should remain the foundation of any U.S. Government-led initiatives, just as the Secure 5G and Beyond Act recognizes.^{7/}

While 5G roll-out will continue to be primarily industry-driven, the U.S. Government controls assets and processes that will be important to the deployment of 5G networks. As the President has stated, “[t]o accelerate and incentivize [5G] investments, my administration is focused on freeing up as much wireless spectrum as needed . . . and removing regulatory barriers to the buildout of networks.”^{8/} T-Mobile strongly supports that initiative – where the U.S. government can facilitate access to spectrum and infrastructure – it should aggressively facilitate 5G deployment and investment and advance U.S. technology and leadership.

Spectrum. Spectrum is the fuel that will power 5G deployment. The data is clear that more spectrum is needed to support the services and applications that will be optimized for use on 5G networks. In 2019, consumer demand for wireless broadband nearly doubled from the previous year to a total of 28.58 trillion megabytes – primarily on pre-5G networks.^{9/} Because 5G networks will be far more advanced than their predecessors, the demand for data on 5G networks is expected to vastly outpace previous estimates. Indeed, 5G networks will be up to 100 times faster than 4G, reduce latency to nearly zero, and be able to handle 100 times the number of connected devices, enabling the Internet of Things.^{10/} Accordingly, as Cisco recently

^{7/} See Secure 5G and Beyond Act § 5(a)(1) (“The Strategy and the Implementation Plan shall not include a recommendation or a proposal to nationalize 5th or future generations wireless communications systems or infrastructure.”).

^{8/} Remarks by President Trump on United States 5G Deployment (Apr. 12, 2019), <https://www.whitehouse.gov/briefings-statements/remarks-president-trump-united-states-5g-deployment/>.

^{9/} See CTIA, *CTIA 2019 Annual Survey Highlights*, at 2 (2019), <https://api.ctia.org/wp-content/uploads/2019/06/2019-Annual-Survey-Highlights-FINAL.pdf>.

^{10/} See CTIA, *What is 5G: A Brief Explainer*, CTIA Blog (Feb. 1, 2018), <https://www.ctia.org/news/what-is-5g-a-brief-explainer>.

reported, 5G is expected to support more than 10 percent of the world's nearly 30 billion devices/connections – 45 percent of which will be mobile – by 2023.^{11/} And Ericsson predicts that total mobile traffic will increase by a factor of five over the next six years, reaching 131 exabytes per month by the end of 2024, with 5G networks carrying a quarter of all global mobile data traffic.^{12/}

To meet those needs, carriers need access to spectrum that spans across high-, mid-, and low-frequency bands. As the FCC has recognized,^{13/} carriers require sufficient amounts of each type of spectrum to operate a 5G network because each category satisfies different network requirements. Indeed, T-Mobile will be able to provide its globally leading 5G service because it secured access to low-, mid-, and high-band spectrum as a result of its merger with Sprint. T-Mobile appreciates the FCC's recent efforts to make additional spectrum available for 5G, including millimeter wave spectrum and re-purposed broadcast spectrum, which forms the foundation of T-Mobile's 5G network, covering more ground and bringing 5G deeper into buildings than any other spectrum.^{14/} The FCC has more recently taken action to make mid-band

^{11/} See Cisco, *New Cisco Annual Internet Report Forecasts 5G to Support More than 10% of Global Mobile Connections by 2023* (Feb. 18, 2020), <https://newsroom.cisco.com/press-release-content?type=webcontent&articleId=2055169>.

^{12/} See Ericsson, *Mobility Report* (2019), <https://www.ericsson.com/49d1d9/assets/local/mobility-report/documents/2019/ericsson-mobility-report-june-2019.pdf>.

^{13/} See, e.g., *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, Report and Order and Proposed Modification, 35 FCC Rcd 2343, ¶¶ 1, 2-3 (2020).

^{14/} See News Release, *T-Mobile 5G: It's On! America's First Nationwide 5G Network Is Here*, T-Mobile (Dec. 2, 2019), <https://www.t-mobile.com/news/americas-first-nationwide-5g-network>; News Release, *That Was Fast! T-Mobile's Network Already Getting Bigger & Better with Sprint*, T-Mobile (Apr. 21, 2020), <https://www.t-mobile.com/news/tmobile-network-already-getting-bigger-better-with-sprint>.

spectrum available in the 3.7-4.2 GHz band (“C-band”) and will begin an auction of low-power, shared spectrum in the 3.5 GHz band for commercial operations in the coming days.^{15/}

But even more mid-band spectrum, in particular, will be needed to meet 5G requirements. In fact, the U.S. has made significantly less mid-band spectrum available in comparison to other leading markets. One report notes that, by the end of the year, the U.S. will only have available for use 70 megahertz of licensed mid-band spectrum between 3 GHz and 7 GHz, whereas the average amount of licensed mid-band spectrum expected to be made available in other countries by the end of 2020 is 382 megahertz.^{16/} If the U.S. wishes to remain a leader in 5G, it must make more mid-band spectrum available as soon as possible.

The FCC cannot address this spectrum requirement on its own – it only oversees non-Federal use of spectrum. NTIA manages spectrum use by Federal agencies. Both the FCC and NTIA must work together to evaluate *all* spectrum options and ensure access to sufficient spectrum for 5G services and beyond. Efforts are already underway at the FCC, in coordination with NTIA, to designate spectrum in the 3.1-3.55 GHz band for wireless broadband services.^{17/} Because the 3 GHz band is being pursued internationally for commercial wireless use, making

^{15/} See *id.*; *Wireless Telecommunications Bureau Announces Accelerated Clearing in the 3.7-4.2 GHz Band*, DA 20-578 (rel. June 1, 2020); *Auction of Priority Access Licenses for the 3550-3650 MHz Band Rescheduled to Begin July 23, 2020*; *Auction 105 Short-Form Application Deadline Postponed to May 7, 2020*, Public Notice, 35 FCC Rcd 2891 (2020).

^{16/} See Analysys Mason, *5G Mid-Band Spectrum Global Update*, at 3-5 (Mar. 2020), <https://api.ctia.org/wp-content/uploads/2020/03/5G-mid-band-spectrum-global-update-march-2020.pdf>. Although the FCC is scheduled to conduct the auction of C-band spectrum later this year, that spectrum is not expected to be cleared until, at the earliest, December 2021 and even then only in certain markets. See *id.*; *Wireless Telecommunications Bureau Announces Accelerated Clearing in the 3.7-4.2 GHz Band*, Public Notice, DA 20-578 (rel. June 1, 2020), <https://docs.fcc.gov/public/attachments/DA-20-578A1.pdf>. The earliest other markets would be cleared is in December 2023.

^{17/} See *Facilitating Shared Use in the 3.1-3.55 GHz Band*, Notice of Proposed Rulemaking, 34 FCC Rcd 12662 (2019).

spectrum in the 3.1-3.55 GHz band available domestically will further benefit consumers by fostering global harmonization.^{18/} NTIA recently released a Technical Report on the 3.45-3.55 GHz portion of the band, which shows that the band could be made available for commercial use if time-based sharing is deployed in the band.^{19/} But that portion of the band will be better suited to 5G use without the restrictions that NTIA suggests. T-Mobile therefore urges NTIA and the FCC to do even more by identifying as much of the band as possible for exclusive, commercial mobile use with appropriate technical rules.

Indeed, Congress has made clear that the focus of re-purposing Federal spectrum must be on making that spectrum available for exclusive licensed use that is globally aligned to the extent feasible.^{20/} While spectrum sharing between Federal agencies and commercial operators may be feasible in some cases, sharing should be implemented in a way that will allow full-power operations and the certainty necessary to provide reliable service. In particular, while T-Mobile appreciates the FCC's efforts to make the 3.5 GHz band available, sharing will limit the utility of that band. Indeed, because of coexistence concerns, that spectrum is subject to transmit power

^{18/} Taiwan recently completed an auction of spectrum in the 3.5 GHz band, and Italy auctioned spectrum in the 3600-3800 MHz band in 2018. See National Communications Commission News, *Auction Commences for Mobile Broadband Business (5G) Licenses* (Dec. 10, 2019), https://www.ncc.gov.tw/english/news_detail.aspx?site_content_sn=360&is_history=0&pages=0&sn_f=5056; *Italian 5G Auction Ends With Bids of EUR6.55bn*, TELEGEOGRAPHY (Oct. 3, 2018), <https://www.commsupdate.com/articles/2018/10/03/italian-5g-auction-ends-with-bids-of-eur6-55bn/>. Seventy-six countries have designated, through ITU Radio Regulations Footnotes, the 3300-3400 MHz band for mobile services on a primary basis and/or identified the 3300-3400 MHz band for International Mobile Telecommunications under specified conditions. See ITU-R, *Provisional Final Acts, World Radiocommunication Conference 2019 (WRC-19)*, at 32-33 (2019), https://www.itu.int/dms_pub/itu-r/opb/act/R-ACT-WRC.13-2019-PDF-E.pdf.

^{19/} See Edward Drocella, et. al, *NTIA Technical Report 20-546, Technical Feasibility of Sharing Federal Spectrum with Future Commercial Operations in the 3450-3550 MHz Band*, at ix (Jan. 2020), https://www.ntia.doc.gov/files/ntia/publications/1-24-2020_ntia_tr-20-546.pdf.

^{20/} See Spectrum Pipeline Act of 2015, Pub. L. No. 114-74, § 1004, 129 Stat. 621 (2015).

levels that are much lower than other flexible-use bands, making them well short of the levels needed for macro broadband deployment.^{21/}

Infrastructure. Without the ability to install antenna facilities, there can be no 5G. And those antenna facilities must cover all network needs for all types of spectrum. That means both macro-tower sites for broad coverage using low- and mid-band spectrum and small cells using high-band spectrum.

The Federal Government is in a unique position to affect change on siting matters, and much has been accomplished in the past several years to facilitate wireless deployments and help ensure U.S. leadership in 5G. For example, in 2018, Congress passed the MOBILE NOW Act, which streamlined infrastructure siting on Federal lands, including by requiring Federal agencies, within 270 days after receiving an application to install, construct, modify, or maintain a communications facility installation on Federal lands, to grant or deny the application.^{22/} It also required NTIA to coordinate with Federal agencies to develop recommendations for tracking and expediting the applications, and required the development of a master contract to govern the placement of communications facility installations on Federal lands.^{23/}

The FCC also has taken several actions within the last few years to help facilitate wireless infrastructure siting. For example, it has facilitated the deployment of replacement poles critical to support next-generation wireless services; clarified and streamlined key elements of the Tribal review process applicable to all deployments; established shot clocks to ensure the timely review of local siting applications for small wireless facilities; and interpreted Sections

^{21/} See Comments of T-Mobile USA, Inc., GN Docket No. 17-183, at 10-11 (filed Oct. 2, 2018).

^{22/} MOBILE NOW Act, Pub. L. No. 115-141, Division P, Title VI, § 606 (2018).

^{23/} *Id.*

253 and 332 of the Communications Act to further accelerate the deployment of 5G-enabling wireless infrastructure.^{24/}

Most recently, the FCC adopted a Declaratory Ruling and Notice of Proposed Rulemaking clarifying its rules implementing Section 6409(a) of the Spectrum Act, which had streamlined the local approval processes for qualifying upgrades to existing wireless facilities.^{25/} It clarified that the 60-day “shot clock” for review and approval of a qualifying 6409(a) application commences when (i) the applicant takes the first procedural step that the locality requires as part of its applicable regulatory review process, and (ii) the applicant submits documentation showing that the modification qualifies for streamlined review.^{26/} It also provided clarification on what constitutes a “substantial change” under the FCC’s rules and when an environmental review is required.^{27/} The Notice of Proposed Rulemaking proposes changes to the FCC’s rules regarding excavation or deployment outside the boundaries of an existing tower site, so that modification of an existing facility that entails ground excavation or

^{24/} See, e.g., *Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment*, Report and Order, 32 FCC Rcd 9760 (2017); *Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment*, Second Report and Order, 33 FCC Rcd 3102 (2018), *affirmed in part, vacated and remanded in part sub nom. United Keetoowah Band of Cherokee Indians in Oklahoma v. FCC*, 933 F.3d 728 (D.C. Cir. 2019); *Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment*, Declaratory Ruling and Third Report and Order, 33 FCC Rcd 9088 (2018) (“*State/Local Siting Order*”), *recon. pending, appeals pending*.

^{25/} See *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, FCC 20-75 (rel. June 10, 2020) (“*5G Upgrade Order*”); Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, § 6409(a) (2012) (“*Spectrum Act*”). Section 6409(a) is intended to streamline the collocation of wireless facilities and equipment on existing infrastructure – currently limited to towers and structures with existing antennas – by requiring jurisdictions to approve qualifying facilities.

^{26/} See *5G Upgrade Order* ¶ 3 (explaining that the 60-day shot clock rule requires State and local governments to approve an eligible facilities request within 60 days of the date on which an applicant submits the request).

^{27/} See *id.* ¶ 4.

deployment of up to 30 feet in any direction outside of the facility’s site will be eligible for streamlined processing under Section 6409(a).^{28/}

Notwithstanding these useful initiatives, more can be done at the Federal level – by Congress, the FCC, and other Federal agencies – to ensure that Federal, State and local government red tape does not become a bottleneck for siting requests and to streamline applicants’ ability to satisfy myriad permitting requirements.

Congress could, for example, enhance recent FCC action by amending Section 6409(a) of the Spectrum Act to further facilitate network upgrades and promote 5G deployments by: (i) expanding the streamlining provisions to cover collocations on existing non-tower structures that are capable of supporting wireless infrastructure, even if they currently lack an antenna; (ii) clarifying that the shot clocks for approvals of collocations covered by the statute apply to *all* permits required for construction; (iii) and codifying the requirements that approvals required by the statute must be issued within 60 days or they will be approved as a matter of law.^{29/}

Congress also could take other actions, building on the helpful actions the FCC has already taken,^{30/} such as requiring by statute that: (i) all siting fees for wireless infrastructure be reasonable, cost-based, and non-discriminatory; (ii) State and local aesthetic, undergrounding, and minimum spacing requirements be objective, published in advance, and non-discriminatory; and (iii) all wireless siting applications be deemed granted if not timely acted on with the FCC’s

^{28/} See *id.* ¶ 5.

^{29/} As noted above, the FCC recently adopted the *5G Upgrade Order*, which makes certain clarifications and seeks comment on boundaries of existing tower sites. See *generally id.* And while the Commission also previously adopted a “deemed granted” remedy in the event that States and localities fail to act on an eligible facilities request within the 60-day window, see 47 C.F.R. § 1.6100(c)(2)-(4), the *5G Upgrade Order* demonstrates that confusion regarding siting rules remain. Congressional action codifying the Section 6409(a) shot clock and deemed granted remedy could help to backstop FCC action.

^{30/} See *generally State/Local Siting Order*.

shot clocks – including applications covered by Section 332 of the Act. These actions could be taken independent of or in combination with many of the bills already before Congress that seek to facilitate 5G infrastructure deployment.^{31/}

For their part, Federal agencies can promote 5G deployments by implementing the President’s recent Executive Order on Accelerating the Nation’s Economic Recovery from the COVID-19 Emergency by Expediting Infrastructure Investments and Other Activities.^{32/} While the Executive Order does not mention telecommunications infrastructure in particular, it provides direction that could facilitate 5G infrastructure deployment by streamlining environmental review processes.^{33/} CEQ, in particular, can complete its proceeding to modernize and clarify its regulations, including by defining what constitutes a “major federal action” and the “reasonably foreseeable” “effects” and “reasonable alternatives” that agencies should consider pursuant to NEPA, and providing all Federal agencies one year to conform their rules to the revised CEQ

^{31/} Those bills include the Streamlining The Rapid Evolution And Modernization of Leading-edge Infrastructure Necessary to Enhance Small Cell Deployment Act, which was reintroduced by Senator Thune in June 2019 and would facilitate the rapid deployment of 5G networks by setting reasonable standards for public review of infrastructure siting while recognizing the unique challenges for small municipalities. *See* Streamlining The Rapid Evolution And Modernization of Leading-edge Infrastructure Necessary to Enhance Small Cell Deployment Act, S. 1699, 116th Cong. (2019). Additionally, Representative Shimkus introduced the Streamlining Permitting to Enable Efficient Deployment of Broadband Infrastructure Act of 2020, which would exempt, for example, certain small communications facilities from environmental review requirements under the National Environmental Policy Act (“NEPA”). *See* Streamlining Permitting to Enable Efficient Deployment of Broadband Infrastructure Act of 2020, H.R. 6488, 116th Cong. (2020).

^{32/} *See* Exec. Order No. 13927, 85 Fed. Reg. 35165 (June 4, 2020) (“Infrastructure Executive Order”). In particular, the Executive Order (i) requires the Department of Defense, the Department of the Interior, and the Department of Agriculture to expedite work on all authorized and appropriated infrastructure projects on Federal land within their authority; (ii) requires the heads of all agencies to work with the Council on Environmental Quality (“CEQ”) to determine how they can take advantage of the NEPA regulations that allow CEQ to make alternative arrangements for satisfying NEPA requirements during emergency circumstances; and (iii) directs agencies to use other emergency-related statutes and regulations to expedite infrastructure projects. *See id.*

^{33/} *See id.*

regulations after they become final.^{34/} The changes that CEQ proposes will facilitate more focused, efficient, effective, and timely NEPA reviews by Federal agencies – which will in turn help to facilitate the development of infrastructure critical to supporting 5G. And the Forest Service can promptly adopt its recently proposed streamlining directives, which include directives to speed the deployment of collocations of communications uses on FS properties.^{35/}

Finally, while the FCC has taken important actions to promote 5G deployment, it can also do more. In addition to moving forward with the Section 6409(a) Notice of Proposed Rulemaking proceeding discussed above, the FCC should work with the Advisory Council on Historic Preservation (“ACHP”) to finalize a Program Comment that would help advance wireless broadband deployment by better enabling the use of so-called Twilight Towers for the collocation of wireless facilities.^{36/}

B. Government Can Help Facilitate Research and Development

NTIA asks about the steps that the U.S. Government can take to further motivate the domestic-based 5G commercial ecosystem to increase 5G research, development, and testing.^{37/} Pressures created by state-sponsored competitors have made it difficult for U.S. and other trusted vendors to dedicate funding to the long-term research, development and testing efforts that will

^{34/} See Council on Environmental Quality, *Update to the Regulations Implementing the Procedural Provisions of the National Environmental Policy Act*, Notice of Proposed Rulemaking, Docket No. CEQ–2019–0003, 85 Fed. Reg. 1684 (Jan. 10, 2020).

^{35/} See Forest Service, *Special Uses; Processing of Applications, Issuance of Authorizations, and Communications Site Management, Proposed Directives*, Proposed Directives, 85 Fed. Reg. 34378 (June 4, 2020).

^{36/} See *Comment Sought on Draft Program Comment for the Federal Communication Commission’s Review of Collocations on Certain Towers Constructed Without Documentation of Section 106*, Public Notice, 32 FCC Rcd 10715 (2017). Twilight Towers are towers that were constructed between March 16, 2001 and March 7, 2005, and that lack documentation showing that the Section 106 National Historic Preservation Act review process was completed.

^{37/} See *Request for Comments* at 32017.

facilitate next generation and beyond technologies. Yet, these efforts are an important foundation for ensuring that secure intellectual property is included in international standards as part of global technology leadership. While competition is, and must remain, an important cornerstone to the U.S. approach to technology development, U.S.-based and other trusted vendors are disadvantaged when they compete against state-sponsored companies, like those against which the U.S. has already acted. Accordingly, the U.S. Government should explore how it can help fund efforts by U.S.-based and other trusted vendors to create a more level playing field.

While U.S. government support will help promote the domestic-based 5G commercial ecosystem to increase 5G research, development, and testing, some efforts are already under way. Indeed, T-Mobile recognizes research as an important part of enabling the highest quality services to its customers. For example, T-Mobile recently engaged with others to launch the 5G Open Innovation Lab, which is a global ecosystem of developers, start-ups, enterprises, academia, and government institutions that focuses on collaboration and supporting emerging 5G applications and services.^{38/} T-Mobile has also maintained Sprint's Accelerator program so that innovative companies and leaders at T-Mobile can collaborate to develop and commercialize the next disruptive emerging products, applications, and solutions using T-Mobile's nationwide 5G network.^{39/} Other innovation programs at T-Mobile include the T-Mobile Launch Pad, which is

^{38/} See T-Mobile News, *5G Open Innovation Lab Launches Inaugural Program for Start-Ups Focused on Emerging Applications for Edge Computing, Artificial Intelligence and More* (May 19, 2020), <https://www.t-mobile.com/content/t-mobile/corporate/news/articles/2020/05/tmobile-intel-nasa-launch-5g-open-innovation-lab.html>.

^{39/} See T-Mobile News, *From AI to VR and Beyond: T-Mobile Accelerator Names Class of 2020 Startups* (May 19, 2020), <https://www.t-mobile.com/content/t-mobile/corporate/news/articles/2020/05/2020-t-mobile-accelerator-startups-will-showcase-5G-innovation.html> (announcing that six companies

a device lab that is designed to analyze performance and pressure test devices across its 5G spectrum,^{40/} and the T-Mobile Tech Experience, which showcases and enables next-generation wireless services to promote innovation through community engagement and partnerships.^{41/}

But wireless service providers are only one part of the ecosystem. T-Mobile relies on technology companies that develop network and user equipment, many of which have engaged in their own research, development, and testing. For example, Nokia’s Bell Labs works towards advancing wireless technologies, driving the 5G engine with research and standardization.^{42/} Similarly, Ericsson’s D15 Lab in Silicon Valley serves as an innovation hub that focuses on the validation of next-generation wireless use cases.^{43/}

As the Federal Government has recognized, some technology companies may represent a threat to U.S. security. As early as 2010, members of Congress and the White House have expressed concern about ensuring the security of U.S. telecommunications networks from two Chinese telecommunications equipment manufacturers – Huawei Technologies Company (“Huawei”) and ZTE Corporation (“ZTE”).^{44/} The Federal Government’s recent actions include:

have been selected to participate in the program in 2020, driving development in AI, drones, robotics, autonomous vehicles, and more).

^{40/} See T-Mobile News, *Built for the 5G Future: T-Mobile Opens New Device Lab* (Aug. 20, 2019), <https://www.t-mobile.com/news/5g-device-lab>.

^{41/} See T-Mobile Tech Experience (last visited June 8, 2020), <https://techexperience.com/>.

^{42/} See Nokia Bell Labs, *5G Standards and Research Leadership* (last visited June 8, 2020), <https://www.bell-labs.com/our-research/5g-standards-and-research-leadership/>.

^{43/} See Ericsson, *Ericsson D-15 Labs* (last visited June 8, 2020), <https://www.ericsson.com/en/about-us/experience-centers/d-fifteen/ericsson-d-15-labs>.

^{44/} See, e.g., Letter from Senator Jon Kyl *et al.* to Hon. Julius Genachowski, Chairman, FCC (dated Oct. 19, 2010); Letter from Representative Anna Eshoo to Hon. Julius Genachowski, Chairman, FCC (dated Nov. 2, 2010); Permanent Select Committee on Intelligence, U.S. House of Representatives, *Investigative Report on the U.S. National Security Issues Posed by Chinese Telecommunications Companies Huawei and ZTE* at iv (Oct. 8, 2012), [https://republicans-intelligence.house.gov/sites/intelligence.house.gov/files/documents/huaweizte%20investigative%20report%20\(final\).pdf](https://republicans-intelligence.house.gov/sites/intelligence.house.gov/files/documents/huaweizte%20investigative%20report%20(final).pdf); Presidential Policy Directive 21, *Critical Infrastructure Security and Resilience* (Feb. 12, 2013), <https://obama>

- The National Defense Authorization Act for Fiscal Year 2019, which prohibits Federal agencies from purchasing or using telecommunications equipment or services produced by Huawei or ZTE as “a substantial or essential component . . . or as critical technology as part of any system.”^{45/}
- The May 15, 2019 Executive Order declaring as a national emergency the unrestricted acquisition or use of information and communications technology or services from foreign adversaries.^{46/}
- The Department of Commerce rulemaking to implement that Executive Order,^{47/} and it added Huawei to its “Entity List,” which prohibited the sale or transfer of American technology to Huawei without a specially granted license from the Bureau of Industry and Security.^{48/}
- FCC adoption of a rule that prospectively prohibits the use of Universal Service Fund support to purchase or obtain any equipment or services from a covered company posing a national security threat, initially designating Huawei and ZTE as covered companies for purposes of this prohibition.^{49/} NTIA recently expressed support for the FCC’s actions.^{50/}

whitehouse.archives.gov/the-press-office/2013/02/12/presidential-policy-directivecriticalinfrastructure-security-and-resil; *Strengthening the Cybersecurity of Federal Networks and Critical Infrastructure*, Executive Order 13800, 82 Fed. Reg. 22391 (May 11, 2017); Letter from Senator Tom Cotton *et al.*, U.S. Senate, to Hon. Ajit Pai, Chairman, FCC (dated Dec. 20, 2017); National Defense Authorization Act for Fiscal Year 2018, Pub. L. 115-91, 131 Stat. 1283, 1762, § 1656 (2017).

^{45/} See National Defense Authorization Act for Fiscal Year 2019, Pub. L. 115-232, 132 Stat. 1636 (2019).

^{46/} See *Securing the Information and Communications Technology and Services Supply Chain*, Executive Order 13873, 84 Fed. Reg. 22689 (May 15, 2019).

^{47/} See *Securing the Information and Communications Technology and Services Supply Chain*, Proposed Rule; Request for Comments, 84 Fed. Reg. 65316 (Nov. 27, 2019).

^{48/} See Press Release, *Department of Commerce Announces the Addition of Huawei Technologies Co. Ltd. to the Entity List*, Department of Commerce (May 15, 2019), <https://www.commerce.gov/news/press-releases/2019/05/department-commerce-announces-addition-huawei-technologies-co-ltd#:~:text=%E2%80%9CThis%20action%20by%20the%20Commerce,world%2C%20on%20the%20Entity%20List>.

^{49/} See *Protecting Against National Security Threats to the Communications Supply Chain Through FCC Programs; Huawei Designation; ZTE Designation*, Report and Order, Further Notice of Proposed Rulemaking, and Order, 34 FCC Rcd 11423 (2019) (establishing, in addition, a process for designating additional covered companies in the future and seeking comment on additional actions to address national security threats to Universal Service Fund-funded networks).

^{50/} See Letter from Douglas W. Kinkoph, Assistant Secretary for Communications and Information (Acting), NTIA, to the Hon. Ajit Pai, Chairman, FCC, WC Docket No. 18-89 *et al.*, at 1 (filed June 9, 2020); see also *Public Safety and Homeland Security Bureau Seeks Comment on the June 9, 2020 Filing by the National Telecommunications and Information Administration in PS Dockets 19-351 and 19352*, Public Notice, DA 20-603 (rel. June 9, 2020).

- The Secure and Trusted Communications Networks Act of 2019, which prohibits Federal funds from being used to purchase communications equipment or services posing national security risks and establishes a reimbursement program for the replacement of communications equipment or services posing such risk.^{51/}
- The Department of Commerce publication of an interim final rule that prohibits Huawei from using U.S. technology and software to design and manufacture its semiconductors abroad.^{52/}

Because these foreign companies are supported by their governments, other equipment and technology providers are forced to compete on an uneven playing field. For example, on May 21, 2020, China announced a six-year \$1.4 trillion tech investment package to roll out “everything from next-generation wireless networks to artificial intelligence.”^{53/} The plan calls on urban governments and high-tech giants like Huawei to help lay 5G wireless networks and reduce China’s reliance on foreign technology. It builds on the country’s “Made in China 2025” initiative, which similarly pushes for greater investment in Chinese high-tech manufacturing in order to seize global leadership in technology development.^{54/}

To combat these efforts, the Federal Government should take steps to support trusted vendors and facilitate the research and development (“R&D”) activities of those entities. Compared to other countries, the U.S. has seen only a relatively small growth in Federal funding of R&D activities. Indeed, according to data from the World Bank, China experienced a year-

^{51/} See Secure and Trusted Communications Networks Act of 2019, Pub. L. 116-124, 47 U.S.C. § 1601 (2020).

^{52/} See Press Release, *Commerce Addresses Huawei’s Efforts to Undermine Entity List, Restricts Products Designed and Produced with U.S. Technologies*, Department of Commerce (May 15, 2020), <https://www.commerce.gov/news/press-releases/2020/05/commerce-addresses-huaweis-efforts-undermine-entity-list-restricts>.

^{53/} See *China has new US\$1.4 trillion plan to seize the world’s tech crown from the US*, SOUTH CHINA MORNING POST (May 21, 2020), <https://www.scmp.com/tech/policy/article/3085362/china-has-new-us14-trillion-plan-seize-worlds-tech-crown-us>.

^{54/} See Melissa Cyrill, *What is Made in China 2025 and Why Has it Made the World So Nervous?*, CHINA BRIEFING (Dec. 28, 2018), <https://www.china-briefing.com/news/made-in-china-2025-explained/>.

over-year average growth rate of 6.71 percent in R&D expenditures as a percentage of Gross Domestic Product (“GDP”) between 1996 and 2017, making it one of the highest growth rates of the countries evaluated, whereas the United States had one of the lowest year-on-year average growth rate at 0.64 percent.^{55/} That is largely because R&D spending has shifted from the Federal Government to industry, universities, State governments, and private non-profit foundations.^{56/} As recently reported by the American Association for the Advancement of Science,^{57/} industry now accounts for the vast majority of R&D spending in the U.S. while Federal R&D spending has declined steadily as a percentage of GDP since its peak in 1964. While industry, non-profits, academia and others should *perform* the R&D work, their ability to perform those functions will be constrained if they do not have the funds available. Thus, the Federal Government must *increase* spending directed to the institutions that perform R&D work.

Fortunately, the U.S. Government has several tools which it can use to promote R&D, particularly by trusted vendors. For example, Congress could develop a short-term grant program to support trusted vendors in their research, development, and testing efforts with a one-time commitment of Federal funds. Similarly, Congress could pass the Utilizing Strategic Allied Telecommunications Act of 2020, which would make grants available to support the deployment and use of 5G networks that follow open standards.^{58/} Congress could also develop a multi-year funding program – authorized through the Department of Commerce, National Science

^{55/} See The World Bank, TCdata360, Research and Development Expenditure (% of GDP) (last visited June 9, 2020), https://tcdata360.worldbank.org/indicators/GB.XPD.RSDV.GD.ZS?country=CHN&indicator=2013&countries=USA&viz=line_chart&years=1996,2017.

^{56/} See Matt Hourihan and David Parkes, *Federal R&D Budget Trends: A Short Summary*, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, at 7 (Jan. 2019), https://www.aaas.org/sites/default/files/2019-01/AAAS%20RD%20Primer%202019_2.pdf.

^{57/} See *id.*

^{58/} See Utilizing Strategic Allied Telecommunications Act, H.R. 6624, 116th Cong. (2020).

Foundation, or related agency – to support early efforts to develop 6G networks and accelerate multi-vendor, standards-based technology. Once new technologies are developed, the U.S. must also maintain strong intellectual property standards to safeguard investments in research and encourage innovation. Through these efforts, Congress could create equipment and technology diversity, inuring to the ultimate benefit of consumers and helping in the race to 5G and beyond.

While the creation of a more diverse equipment ecosystem will be a complex and long-term process, the Federal Government can explore opportunities beyond grant programs to support vendors and technology companies that do not present security risks. For example, financing from the U.S. Export-Import Bank and the International Development Finance Corporation could be expanded for trusted vendors with attractive loan and payment terms. Not only would that approach assist trusted vendors in the 5G equipment market, but it would also benefit any downstream supplier that is expected to be a part of the 5G ecosystem. Additionally, Congress could encourage U.S. participation in global standards bodies by, for example, directing the Internal Revenue Service to declare that the costs of participation are recognized for favorable treatment under the R&D tax credit^{59/} and directing NIST to explore ways to reduce the costs of obtaining voting memberships in key standards bodies. Strong participation in standards bodies ensures a fair global wireless ecosystem and reduces fragmented and unequal wireless systems developing on a regional level.

III. CORE SECURITY PRINCIPLES OF 5G INFRASTRUCTURE

NTIA requests input on factors that the U.S. Government should consider in the development of core security principles for 5G infrastructure and asks whether there are

^{59/} See 26 U.S.C. § 41.

stakeholder-driven approaches that the U.S. Government should consider.^{60/} Responsible industry participants are taking action to ensure that commercial networks and devices are secure, and stakeholder efforts are underway to promote security features of 5G networks. For instance, the 3rd Generation Partnership Project (“3GPP”), which unites seven telecommunications standard development organizations and provides their members with a stable environment to produce the reports and specifications that define 3GPP technologies, has specified and standardized mobile wireless industry security features and mechanisms for 3G, 4G, and now 5G technologies.^{61/} Security features of today’s commercial 5G networks based on 3GPP standards include, among other things, primary authentication (network and device mutual authentication) and secondary authentication (authentication with data networks outside the mobile operator domain), subscriber identifiers to protect subscriber identity privacy, and a service-based architecture with security protocols protecting transmissions between core components at the IP layer.^{62/}

Moreover, U.S. telecommunications policy has long meant creating a technology-neutral environment that promotes innovation. Indeed, the FCC has repeatedly highlighted its commitment to technology neutrality as a hallmark of its rules and policies.^{63/} As FCC

^{60/} See *Request for Comments* at 32017.

^{61/} See 5G Americas Whitepaper, *The Evolution of Security in 5G*, at 6 (Oct. 2018), https://www.5gamericas.org/wp-content/uploads/2019/07/5G_Americas_5G_Security_White_Paper_Final.pdf.

^{62/} See *id.* at 6-17; Anand R. Prasad *et al.*, *3GPP 5G Security*, 3GPP (Aug. 6, 2018), https://www.3gpp.org/news-events/1975-sec_5g; *5G Cybersecurity: 3GPP vs. NIST – Understanding the Standards*, RCR WIRELESS (Feb. 3, 2020), <https://www.rcrwireless.com/20200203/5g/5g-cybersecurity-3gpp-vs-nist-understanding-the-standards>.

^{63/} See, e.g., *Expanding Access to Broadband and Encouraging Innovation Through Establishment of an Air-Ground Mobile Broadband Secondary Service for Passengers Aboard Aircraft in the 14.0-14.5 GHz Band*, Notice of Proposed Rulemaking, 28 FCC Rcd 6765, ¶ 101 (2013) (stating that the Commission “strive[s] to establish technology neutral rules that allow for competing technologies and changes in technology over time without the need to change our rules”); *Amendment of the Commission’s*

Chairman Pai has stated, “[t]he best way to maximize the benefits of new technologies is to promote a competitive marketplace and let market forces work” and “[p]romoting competition means technology-neutral rules.”^{64/} That should remain the touchstone of U.S. Government efforts.

Nevertheless, there is an inextricable link between 5G security and the type of actions the U.S. Government can take to promote 5G. For example, as noted above, the U.S. Government can reform its siting policies by removing barriers to infrastructure deployment, particularly to promote both the expansion and modification of existing macro cell sites as well as new small cell sites.^{65/} The more quickly 5G networks can be deployed in the U.S., the more likely that the U.S. can lead technology development, with trusted vendors, used in the 5G rollout. And if trusted vendors are used for fast 5G builds, then it is less likely that foreign entities will control 5G technology, potentially threatening national security. Accordingly, the U.S. Government, in addition to taking the actions above, should adopt policies that promote relieving industry of burdensome siting restrictions.

Rules with Regard to Commercial Operations in the 3550-3650 MHz Band, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959, ¶ 228 (2015) (noting that the FCC’s “longstanding policies promot[e] technological neutrality and competition in emerging bands”).

^{64/} Remarks of FCC Chairman Ajit Pai at the 18th Global Symposium for Regulators, Geneva, Switzerland, at 2 (July 10, 2018), <https://docs.fcc.gov/public/attachments/DOC-352412A1.pdf>.

^{65/} See, e.g., Letter from Cathleen A. Massey, Vice President, Federal Regulatory Affairs, and David M. Crawford, Principal Corporate Counsel, Federal Regulatory Affairs, T-Mobile, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 19-250 *et al.* (filed May 13, 2020) (urging the FCC to clarify its rules implementing Section 6409(a) of the Spectrum Act, which directs States and localities to approve any eligible facilities request for a modification of an existing wireless tower or base station that does not substantially change the physical dimensions of the tower or base station, but pursuant to which some jurisdictions continue to erect barriers); Comments of T-Mobile USA, Inc., WT Docket No. 19-250 *et al.* (filed Oct. 29, 2019); Reply Comments of T-Mobile USA, Inc., WT Docket No. 19-250 *et al.* (filed Nov. 20, 2019).

In addition, the U.S. Government must develop a clear set of criteria in determining whether providers of equipment and services should be considered trusted vendors. Trusted vendors should be those that have been found not to impose a security risk, but also have demonstrated a commitment to the U.S. economy by, for example, locating facilities in the United States.^{66/} Even without a significant U.S. presence, suppliers may be considered “trusted vendors” if they adhere to specific political and governance criteria. For example, among other criteria, they should be headquartered in a country with a democratically elected government and with an independent judiciary. They should also be headquartered in a country with a demonstrable record of protecting personal data and a demonstrable record of observance of their international human rights commitments. Moreover, suppliers should be considered “trusted vendors” if they abide by certain business practices criteria. For example, they should have transparent ownership and corporate governance structures that can be independently verified. They should be financed openly and transparently and can demonstrate adherence and observation of internationally recognized accounting standards.

To the extent a supplier does not meet these criteria, it could still be considered a trusted vendor if its technology adheres to certain cybersecurity criteria. If a supplier’s technology, for instance, has passed independent and credible risk assessments and security evaluations, the supplier may be considered a trusted vendor. Similarly, the risk of using a supplier’s technology could be reduced, thus making it a “trusted vendor,” if the supplier (i) demonstrates that its technologies are built and maintained according to internationally recognized, open, and

^{66/} For example, Ericsson’s D15 lab is located in Silicon Valley, and Nokia has located four of its 17 global research centers throughout the U.S., including its global headquarters in New Jersey. *See* Ericsson, Introducing Ericsson D-15 (last visited June 10, 2020), <https://www.ericsson.com/en/about-us/experience-centers/d-fifteen>; Nokia Bell Labs, Murray Hill, NJ, USA (last visited June 10, 2020), <https://www.bell-labs.com/connect/global-locations/murray-hill-new-jersey-usa/#:~:text=Murray%20Hill%2C%20NJ%2C%20USA,international%20airports%20and%20major%20highways>.

consensus-based standards; (ii) has a record of addressing and remediating security flaws; and (iii) is able to demonstrate that it has adequate oversight and contractually binding security and quality assurances with third-party providers of components for its products.

IV. RISKS TO U.S. ECONOMIC AND NATIONAL SECURITY DURING DEVELOPMENT AND DEPLOYMENT OF 5G INFRASTRUCTURE WORLDWIDE

NTIA asks how the U.S. Government can best address the economic and national security risks presented by the use of 5G worldwide and best promote 5G vendor diversity and foster market competition.^{67/} The deployment of 5G constitutes a significant economic opportunity for the U.S. By being the leader in 4G, the U.S. was able to take advantage of the opportunities of developing related technologies, such as applications that fueled the “app economy” and that have now been adopted worldwide. Those developments fostered tremendous economic benefits. The launch of 4G shifted the trajectory of the wireless industry’s contribution to the U.S. from a projected \$350.3 billion to a realized \$445.0 billion in 2016 – an increase of nearly \$100 billion.^{68/} U.S. leadership in 4G also increased total wireless-related jobs by 84 percent from 2011 to 2014.^{69/}

5G leadership will allow the U.S. to realize similar benefits. Not only can the U.S. be a leader in industries like applications, but it can also lead in technology research, development, and testing by creating favorable economic environments and adopting the policies discussed above. Doing so will foster the safe and secure deployment of 5G networks while also, like

^{67/} See *Request for Comments* at 32017.

^{68/} See *How America’s 4G Leadership Propelled the U.S. Economy*, RECON ANALYTICS, at 1 (Apr. 16, 2018), https://api.ctia.org/wp-content/uploads/2018/04/Recon-Analytics_How-Americas-4G-Leadership-Propelled-US-Economy_2018.pdf.

^{69/} See *id.*

application development, creating U.S. jobs and contributing to economic growth. Indeed, America's wireless companies are investing an estimated \$275 billion into building 5G networks, which are expected to create three million new jobs – with one out of every 100 Americans estimated to benefit from a new 5G job – and add \$500 billion to the economy.^{70/} Every industry, including healthcare, energy, transportation, law enforcement, e-commerce, logistics, and education will be positively impacted by 5G. Adopting the proposals above will spur this growth and help ensure that trusted vendors are adequately supported and can proliferate, which will produce vendor diversity and market competition benefits.

V. RESPONSIBLE GLOBAL DEVELOPMENT AND DEPLOYMENT OF 5G

Last, NTIA seeks comment on how the U.S. Government can best lead the responsible and international development and deployment of 5G technology and promote the availability of secure and reliable equipment services.^{71/} To achieve these goals, the U.S. Government can, as noted above, create a domestic regulatory and policy environment that promotes the deployment of 5G through spectrum availability, sensible siting regulations, and responsible business practices. In addition, U.S. Government promotion of private R&D efforts by trusted vendors through grant programs, tax incentives, loans, and other initiatives can help promote and support a diverse and secure 5G technology ecosystem worldwide.

While industry should generally take the lead in participation in standards-setting and similar groups, the U.S. government can support those efforts by ensuring that all industry participants are aware of those efforts and by adopting policies that support and justify participation. The U.S. should also continue its strong participation and presence in fora like the

^{70/} See CTIA, *The 5G Economy* (last visited June 10, 2020), <https://www.ctia.org/the-wireless-industry/the-5g-economy>.

^{71/} See *Request for Comments* at 32017.

International Telecommunication Union (“ITU”), where government-to-government negotiations occur. It should continue to promote private participation and collaboration with the U.S. Government in efforts to develop U.S.-led positions at those international meetings through transparent advisory committees, such as the World Radiocommunication Conference Advisory Committee.

The best tool or approach to mitigate risk from other countries’ 5G infrastructure is to ensure strong and early U.S. deployment of 5G and to create a favorable environment for U.S.-based research, development, and testing of next-generation technologies. Nevertheless, the U.S. should, when appropriate, use other tools to prevent or discourage the deployment of infrastructure that represents a demonstrated security threat to the U.S. As NTIA observes and explained above,^{72/} the Federal Government has appropriately taken those steps in the case of Huawei and ZTE, with the FCC commencing a rulemaking and the Department of Commerce adopting rules to address the security of the telecommunications infrastructure supply chain. The U.S. Government should consider similar measures in the future against other companies, if necessary, to protect 5G infrastructure development and deployment.

VI. CONCLUSION

T-Mobile appreciates the U.S. Government’s ongoing work to promote the development, deployment, and management of 5G equipment and networks. To further facilitate secure 5G rollout in the U.S., T-Mobile encourages the U.S. Government to consider ways in which it can make additional spectrum available for commercial use, improve wireless infrastructure deployment and review processes, and promote 5G R&D. The U.S. Government should also consider ways to better ensure the security of 5G equipment and networks through targeted

^{72/} See *Request for Comments* at 32017.

policies that support trusted vendors domestically and internationally. Putting these actions into place now will ensure that the U.S. remains a leader in 5G and the future development of next-generation wireless technologies.

Respectfully submitted,

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