

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

In The Matter of)	
)	
)	
Petition for Rulemaking Regarding the)	RM-11788
Citizens Broadband Radio Service ¹)	RM-11789
)	
Amendment of the Commission’s Rules)	GN Docket 12-354
with Regard to Commercial Operations)	
in the 3550-3650 MHz Band)	

5G AMERICAS COMMENTS ON T-MOBILE PETITION

5G Americas, the voice for 5G and LTE in the Americas, hereby comments in support of key aspects of T-Mobile USA, Inc.’s (“T-Mobile”) and CTIA’s Petitions to modify the rules governing the 3550 – 3700 MHz band to better facilitate the deployment of Fifth Generation (“5G”) of wireless technologies. That band of spectrum is in the middle of a global push for 5G in the broader range of 3.3-4.2 GHz. The effort to identify that mid-band spectrum for 5G is already underway in a number of countries in each of the world’s regions. Access to mid-band spectrum is critically important to the success of 5G and U.S. leadership in the next generation of wireless technology. Unfortunately, the Commission’s current rules for the 3550-3700 MHz band make it an island in the middle of that globally harmonizing sea. Because 5G requires access to low-, mid- and high-band spectrum, rules that suppress carrier investment in networks

¹ Petition for Rulemaking Regarding the Citizens Broadband Radio Service, Public Notice, DA 17-609 (June 22, 2017).

necessary to deploy 5G in 3550-3700 MHz will undermine the U.S.' ability to lead in 5G. To encourage investment in the band, 5G Americas supports T-Mobile's and CTIA's proposals that the Commission revise the Part 96 rules to make PAL licenses have longer license terms, larger geographic areas, and protect CBSD registration information. 5G Americas also supports Qualcomm's proposal to relax OOBE for devices in the band, to maximize the viability of this band for 5G.

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I. INTRODUCTION

5G Americas, the voice for 5G and LTE in the Americas, applauds the Wireless Telecommunications Bureau and the Office of Engineering and Technology's decision to seek comment on T-Mobile USA, Inc.'s ("T-Mobile") and CTIA's Petitions to modify the rules governing the 3550 – 3700 MHz band to better facilitate the deployment of Fifth Generation ("5G") or wireless technologies ("5G"). That band of spectrum is in the middle of a global push for 5G in the broader range of 3.3-4.2 GHz. This worldwide effort is already underway in a number of countries, in each of the world's regions. Access to mid-band spectrum is critically important to the success of 5G and to U.S. leadership in the next generation of wireless technology deployment. Unfortunately, the Commission's current rules for the 3550-3700 MHz band make it an island in the middle of that globally harmonizing sea. Because 5G requires access to low-, mid- and high-band spectrum, rules that suppress carrier investment in networks necessary to deploy 5G in 3550-3700 MHz will undermine the U.S.' ability to lead in 5G.² 5G Americas supports key aspects of T-Mobile's and CTIA's Petition that the Commission take steps to maximize the viability of this band for 5G, including ten-year licenses with an expectation of renewal and a Partial Economic Area-like geographic scope. 5G Americas also supports their proposals to protect CBSD registration information from public disclosure, and agrees with Qualcomm's proposal to relax Out-of-Band Emission ("OOBE") limits for devices in the band to allow wider channelization such as 40 MHz, consistent with 3GPP specifications for 4G LTE and 5G channels.

² See e.g., *5G Spectrum Recommendations*, Introduction, 5G AMERICAS, at 2 (April 2017), available at http://www.5gamericas.org/files/9114/9324/1786/5GA_5G_Spectrum_Recommendations_2017_FINAL.pdf ("5G Spectrum Recommendations").

5G Americas is an industry trade organization composed of leading telecommunications service providers and manufacturers. Our mission is to advocate for and foster the advancement and full capabilities of LTE wireless technology and its evolution beyond to 5G, throughout the ecosystem's networks, services, applications and wirelessly connected devices in the Americas. 5G Americas is invested in developing a connected wireless community while leading 5G development for all of the Americas. Currently chaired by AT&T, 5G Americas Board of Governors includes América Móvil, Cable & Wireless, Cisco, CommScope, Entel, Ericsson, Hewlett Packard Enterprise (HPE), Intel, Kathrein, Mitel, Nokia, Qualcomm, Samsung, Sprint, T-Mobile US, Inc. and Telefónica.

5G Americas is a Market Representative Partner of 3GPP, and an MOU partner with other 5G organizations from Europe, China, Japan, South Korea and Brazil for a biennial Global 5G Event. 5G Americas represents Region 2 (the Americas) in these biennial Global 5G Events. As such, 5G Americas has a unique perspective on the role spectrum policy can have in facilitating the deployment of broadband in our Region, and throughout the world. Our association has long advocated for policy that favors making internationally-harmonized spectrum available to the market. The amount of proceeds from the auction of AWS-3 spectrum, which paired spectrum internationally harmonized for LTE, relative to auctions of non-internationally-harmonized spectrum, proves the economic value of spectrum that has been internationally harmonized for 3GPP-based technology. When the U.S. government first began to consider making the band available for commercial use in 2010, the international mobile community was not yet actively exploring spectrum above 3.5 GHz for mobile broadband.³

³ See *Plan and Timetable to Make Available 500 MHz of Spectrum for Wireless Broadband*, Department of Commerce at ii (2010), available at https://www.ntia.doc.gov/files/ntia/publications/tenyearplan_11152010.pdf

Since that time, given the growth in demand for mobile broadband, the global industry has begun to standardize 3GPP technologies targeting that band, including 5G New Radio. Commission action consistent with T-Mobile's and CTIA's Petitions for longer and larger license terms, and Qualcomm's request for revision of the OOB limits to facilitate larger channelization consistent with 3GPP standards will facilitate 5G in 3550-3700 MHz and better position the U.S. in 2017 for global leadership in 5G.

II. 5G AMERICAS SUPPORTS KEY ELEMENTS OF T-MOBILE AND CTIA'S PETITIONS ON 3.5 GHZ

5G is planned for deployment in low, mid and high-band frequencies, with different applications or capabilities optimized for different ranges.⁴ 5G Americas appreciates the Commission's earlier and continued efforts on millimeter wave spectrum in the *Spectrum Frontiers* proceeding,⁵ but to realize the full potential of 5G in the U.S., operators must have access to all types of spectrum for 5G including licensed, shared and unlicensed and low, mid and high band spectrum.⁶

A. Enhancing the PAL Framework with Facilitate US Global Leadership on 5G

As T-Mobile and CTIA note in their Petition, 3550-3700 MHz is the only mid-band spectrum in the "pipeline" of regulatory decision making for commercial broadband access,⁷ so it is

⁴ See 5G Spectrum Recommendations at 2.

⁵ *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Report & Order, GN Docket No. 14-177, FCC 16-89, 31 FCC Rcd. 8014 (July 14, 2016); *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Notice of Proposed Rulemaking, GN Docket No. 14-177, FCC 15-138, 30 FCC Rcd. 11878 (October 23, 2017).

⁶ See *supra* at n. 3.

⁷ See T-Mobile USA, Inc., Petition for Rulemaking, GN Docket No. 12-354, at 5 (filed June 19, 2017) ("T-Mobile Petition"); CTIA, Petition for Rulemaking, GN Docket No. 12-354 (June 16, 2017) ("CTIA Petition").

imperative that Commission rules facilitate investment for 5G. The 3.5 GHz range is a key band for globally harmonized 5G. The Commission acting to improve the 3.5 GHz rules to optimize 5G deployment will position U.S. for 5G leadership, because of the combination of capacity and coverage the band offers. As 5G Americas notes in its *White Paper on 5G Spectrum Recommendations*, 5G usage scenarios for mid-range bands like 3.5 GHz include enhanced mobile broadband, ultra-reliable communications requiring medium-long range, and massive Machine-Type Communications (aka IoT) requiring operation near fast-moving obstacles.⁸ U.S. policy leaders have recognized the importance of the mid-band for 5G. Senator Thune, Chairman of the Senate Committee on Commerce, Science and Transportation, recently sent a letter to Chairman Pai urging that he look at the entire mid-range of 3 – 7 GHz for new commercial broadband technologies.⁹ In the most current version of the *Mobile Now* bill, the bill directs the Commission to consider the entire 3100 – 4200 MHz range for commercial broadband technologies.¹⁰ And of course, the Commission itself issued an *Notice of Inquiry* earlier this month recognizing the need to explore mid-range spectrum for commercial broadband, including 3.7 – 4.2 GHz.¹¹

Policymakers' increased interest in the band has been matched by industry's. As T-Mobile recounts in its Petition, there are an increasing level of experiments and trial deployments

⁸ See 5G Spectrum Recommendations, Table 15 (*Spectrum Ranges Considered Suitable for 5G Applications*) at 24-25.

⁹ See Letter from John Thune, Senator and Chairman, Committee on Commerce, Science, and Transportation, to Ajit V. Pai, Chairman, FCC (June 21, 2017), available at <https://www.commerce.senate.gov/public/cache/files/3cefb171-0d50-4c23-9f31-48942e874cc6/4CAB0C0B754962807BB0C203E951D581.thune-letter-on-mid-band-spectrum.pdf>

¹⁰ See Mobile Now Act, S. 19, 115th Cong. § 5.3 (2017)

¹¹ See *Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, Notice of Inquiry, GN 17-183 (July 13, 2017), available at http://transition.fcc.gov/Daily_Releases/Daily_Business/2017/db0713/DOC-345789A1.pdf

in the 3550-3700 MHz by the mobile industry.¹² These trials span industrial IoT and small cells for enhanced mobile broadband, and are ready to be commercialized when the rules make such operation *practical*.¹³

As 5G Americas and other have noted,¹⁴ the interest in 5G in the 3 GHz band is global. There is now a global consensus that spectrum in the 3 – 5 GHz ranges is the main mid-range target for 5G.¹⁵ At the last World Radiocommunication Conference, in 2015 (“WRC-15”), the range 3.4 – 3.6 GHz was identified for mobile broadband globally.¹⁶ The range just below, 3.3 – 3.4 GHz, was identified by approximately fifty countries. And the range 3.6 – 3.7 GHz was identified by four countries in our region.¹⁷ In the year and a half since WRC-15, additional countries have announced plans to make the 3 GHz band available for commercial broadband, many with a specific reference to 5G. The European Radio Spectrum Policy Group late last year advised the European Commission that the 3.4 – 3.8 GHz band is the “primary band suitable for the introduction of 5G-based services in Europe even before 2020”.¹⁸ Consistent with this

¹² See T-Mobile Petition at 5-6 and n. 21, noting that technology companies, equipment manufacturers, and wireless providers are increasingly looking at 3.5 GHz for 5G, with an expanding focus in just the past few months; see also CTIA Petition at 4.

¹³ *Id.* (quoting *Verizon aims to deploy small cells in 3.5GHz when practical*) FIERCE WIRELESS (March 10, 2017)).

¹⁴ See CTIA Petition at 4-5.

¹⁵ See 5G Spectrum Recommendations at 10.

¹⁶ At the International Telecommunication Union, which hosts the World Radiocommunication Conference, IMT – or International Mobile Telecommunications – is the term used for mobile broadband. IMT 2020 is the next generation of broadband being explored by the ITU, and is synonymous with 5G. Identifications for IMT may be used by IMT 2020.

¹⁷ The range 3.6 – 3.7 GHz was identified by Canada, Colombia, Costa Rica and the U.S. See ITU Radio Regulations, 5.434. Typically at the ITU, an identification made by the U.S. is, if not immediately adopted regionally, followed by the rest of the Region at the next WRC, and Europe and Asia tend to follow CITELE identifications at subsequent WRCs. Hence, U.S. leadership is both beneficial to U.S. consumers in the near term, in new applications and better service, but in the long term, tends to result in global harmonization, and longer term economies of scale and scope additionally benefitting U.S. consumers. Recent activity on making the 3 GHz band available for 5G and commercial broadband since WRC-15 bears this point out.

¹⁸ See EUROPEAN COMMISSION, RADIO SPECTRUM POLICY GROUP, STRATEGIC ROADMAP TOWARDS 5G FOR EUROPE, 3 (2016), available at http://rspg-spectrum.eu/wpcontent/uploads/2013/05/RPSG16-032-Opinion_5G.pdf.

recommendation, European regulators are beginning to auction the band for exclusive licensed use. Ireland recently auctioned off parts of the 3 GHz band, including 3475 – 3800 MHz.¹⁹ In its decision, the Irish regulator noted that the band was “particularly suitable for the potential deployment of high speed broadband services”.²⁰ The United Kingdom has also taken actions to auction part of the 3 GHz band, and has initiated a rulemaking that proposed to make 3.6 – 3.8 GHz available for 5G and other future mobile services.²¹ Spain has also recently begun a proceeding on examining bands for 5G, including in the mid-band range of spectrum.²²

Europe has framed leadership in 5G as an economic imperative for the Continent.²³ But other regions, notably Asia, are likewise aggressively seeking to deploy 5G. Australia has issued a discussion paper on making the 3575 – 3700 MHz band available for mobile broadband.²⁴ Singapore has also recently begun a proceeding on examining bands for 5G, including in the mid-band range.²⁵ Japan and South Korea are each targeting 5G deployments next year and in 2020 when they host upcoming international sporting events, like the Winter (Korea 2018) and

19 See Press Release, Commission for Communications Regulation, Five Winning Bidders in ComReg’s 3.6 GHz Band Spectrum Award, available at https://www.comreg.ie/media/dlm_uploads/2017/05/Media-Release-22.05.17.pdf.

20 See COMMISSION FOR COMMUNICATIONS REGULATION, RESPONSE TO CONSULTATION AND DECISION ON PROPOSED 3.6 GHZ BAND SPECTRUM AWARD, 28 (July 11, 2016), available at https://www.comreg.ie/media/dlm_uploads/2016/07/ComReg1657.pdf.

21 See *Awards in progress: 2.3 and 3.4 GHz auction*, OFCOM (Nov. 21, 2016), available at <https://www.ofcom.org.uk/spectrum/spectrum-management/spectrum-awards/awards-in-progress>; OFCOM, IMPROVING CONSUMER ACCESS TO MOBILE SERVICES AT 3.6 TO 3.8 GHZ (rel. Oct. 6, 2016), available at https://www.ofcom.org.uk/data/assets/pdf_file/0035/91997/3-6-3-8ghz-consultation.pdf.

22 See *Spain launches public 5G consultation*, TELEGEOGRAPHY (July 7, 2017), available at <https://www.telegeography.com/products/commsupdate/articles/2017/07/07/spain-launches-public-5g-consultation/>.

23 See *Digital Single Market*, EUROPEAN COMMISSION (last accessed July 21, 2017), available at https://ec.europa.eu/commission/priorities/digital-single-market_en.

24 See *Future use of 1.5 GHz and 3.6 GHz bands*, AUSTRALIAN COMMUNICATIONS AND MEDIA AUTHORITY, (Oct. 2016), http://www.acma.gov.au/theACMA/future-use-of-the-1_5-ghz-and-3_6-ghz-bands.

25 See *5G mobile services and networks*, INFOCOMM MEDIA DEVELOPMENT AUTHORITY (May 23, 2017).

Summer Olympics (Japan 2020).²⁶ While Japan's international stage is the further in the future, it has already allocated and licensed spectrum in the 3.5 GHz band for mobile broadband, and its regulator has identified the 3.4 GHz band as a candidate band for 5G services. When Japan hosted the Global 5G Event in May this year, it had 3 GHz band 5G demonstrations on hand for attendees.²⁷ China recently issued a public consultation requiring comments on its plans to use the 3300-3600 MHz and 4800 – 5000 MHz bands for 5G.²⁸ Hong Kong has also issued a Work Plan for 5G, examining the 3.4-3.7 GHz and other bands.²⁹ Russia, spanning eleven time zones and bordering both Europe and Asia, has likewise targeted its hosting of next year's World Cup for show-casing 5G.³⁰

In our own Region, 5G Americas has worked with regulators in Latin America and the Caribbean to educate them on the value of the 3 GHz and other bands for 5G. To date, Colombia has an allocation for mobile in the 3500 – 4200 MHz band, and Argentina has an allocation for mobile in the 3300 – 3400 MHz.³¹ Colombia has discussed auctioning the 3500 MHz band,

²⁶ See Monica Allevan, *Huawei targets 2018 World Cup in Russia for 5G trial*, FIERCEWIRELESS (November 20, 2017), available at <http://www.fiercewireless.com/tech/huawei-targets-2018-world-cup-russia-for-5g-trial>; Erwan Lucas, *In South Korea, the race is on for Olympics 5G next year*, PHYS.ORG (February 28, 2017), available at <https://phys.org/news/2017-02-south-korea-olympics-5g-year.html>; Ryan Daws, *Japan Prepares for the 2020 Olympics Games with 5G trial system*, TELECOMS (May 31, 2017), available at <https://www.telecomstchnews.com/news/2017/may/31/japan-prepares-2020-olympic-games-5g-trial-system/>.

²⁷ See *Huawei, DOCOMO carry out live 5G demo of 39GHz mmWave technology*, TELEGEOGRAPHY (June 27, 2017), available at <https://www.telegeography.com/products/commsupdate/articles/2017/06/27/huawei-docomo-carry-out-live-5g-demo-of-39ghz-mmwave-technology/>.

²⁸ See Monica Allevan, *China issues plan to use 3300-3600 MHz, 4800-5000 MHz for 5G*, FIERCEWIRELESS (June 7, 2017), available at <http://www.fiercewireless.com/wireless/china-issues-plan-to-use-3300-3600-mhz-4800-5000-mhz-for-5g>.

²⁹ Press Release, CA's work plan for making available additional radio spectrum to meet demand of public mobile services towards 2020 and beyond, Communications Authority, available at <http://www.info.gov.hk/gia/general/201703/21/P2017032100669p.htm>.

³⁰ See *Russia connected. 5G for Russian digital economy*, TASS (May 29, 2017), available at <http://tass.com/sp/948333>; see also CTIA Petition at 5.

³¹ See 5G Spectrum Recommendations at 11.

anticipating an auction in the 2017-2019 timeframe.³² At the last meeting of the radiocommunications subcommittee of the Inter-American Committee on Telecommunications (“CITEL PCC.II”), CITEL adopted a recommendation that countries in the Americas consider making spectrum in the 3300 – 3700 MHz available for mobile broadband.³³

Given the global interest in this mid-range spectrum for 5G, the Commission should revise its rules to attract 5G investment in the band, which means optimizing the rules for operator deployment.

B. PALS Should be Authorized on Standard, Ten-Year License Terms with an Expectation of Renewal

To make the band attractive for operators, the Commission should adopt T-Mobile’s and CTIA’s proposals that Priority Access Licensees should be authorized on standard, ten-year license terms, with an expectation of renewal.³⁴ 5G Americas agrees with their arguments on this issue. 5G Americas also notes that recently, European operators have pressed the European Commission that license terms for their investment in new broadband technologies be for twenty-five years.³⁵ In light of a request for a quarter-century term to promote investment, the Commission’s current three-year license term clearly appears inadequate for facilitating 5G deployment.

³² *Id.*

³³ *See Frequency Arrangements for the Terrestrial Component of IMT in the Bands 3300-3400 MHz, 3400-3600 MHz and 3600-3700 MHz, or Combinations Thereof*, CITEL, Draft Recommendation, PCC.II/Rec. XXX (29-17) (June 207, 2017).

³⁴ *See* T-Mobile Petition at 11; CTIA at 6-9.

³⁵ *See, e.g.*, Letter from Deutsche Telekom, KPN, Orange, Telecom Italia, Telefónica, Telekom Austria, Telenor Group, Telia Company, Vodafone Group, and the GSMA (leading operators warn that Europe faces falling behind other developed markets in deploying 5G if it fails to reform spectrum and that 25 year licenses for 5G, coupled with a strong presumption of renewal, are necessary to position Europe as a true global leader), to European Union, reported on at <http://www.capacitymedia.com/Article/3733800/News/European-operators-fire-another-5G-warning-at-EU>.

C. The Total Number of PALS in a Geographic Area for which Applicants have Applied for Renewal should be made Available

5G Americas likewise agrees with T-Mobile that interest in operating with a license in a particular area in the 3.5 – 3.7 GHz band should be met with a licensing opportunity. The law requires that mutually exclusive applications be auctioned.³⁶ For decades, consistent with the policy goals of ensuring efficient spectrum use through market-based mechanisms, Commission policy has allowed an entity to apply for a spectrum license, even if mutual exclusivity does not exist. Likewise, the Commission has rarely removed the opportunity for license renewal in favor of unlicensed use, and certainly not with respect to a service with growing consumer demand like licensed mobile broadband. The Commission should return to the sound policy that enabled the U.S. to lead the world in 4G deployment, and revise the current Part 96 rules to provide that the total number of PALS in a geographic area for which applicants have applied for renewal be made available.

D. Bidding on Specific Blocks of Spectrum Should be Permitted

To encourage robust use of the mid-band for 5G, the Commission should also grant T-Mobile's petition that bidding on specific blocks of spectrum should be permitted.³⁷ In addition to aligning with Commission policy in the most recent auction for mobile broadband spectrum, in the 600 MHz, such an auction policy would align with other countries that are planning to auction portions of the band.

³⁶ See Communications Act of 1934, 47 U.S.C. § 309(j)(1) (2015); see also Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96 § 6701(a) (relocation for exclusive non-Federal use prioritized over sharing), 126 Stat. 156 (2012).

³⁷ See T-Mobile Petition at 15.

E. PALS Should be Assigned on PEA-like basis, with areas far larger than Consensus Tracts

To encourage investment, 5G Americas also believes that the Commission’s current rules that intend to award PAL use in the 3.5 GHz band with the operational scope of a Census Tract should be revised to provide much greater geographic scope. 5G Americas therefore recommends that ten-year licenses, with an expectation of renewal, be awarded on a geographic basis akin to a Partial Economic Area, for the reasons T-Mobile and CTIA articulate.³⁸

F. SAS Managers Should Protect CBSD Registration Information

5G Americas agrees with T-Mobile and CTIA in their Petition that Spectrum Access System (“SAS”) Managers should protect CBSD registration information, and should not have to make that information publicly available, as the current Part 96 rules provide.³⁹ 5G Americas agrees that the protection of that data, other than as exchanged under Part 96 rules between approved SAS managers, would result in fewer security concerns, as well as competitive concerns for PALs.⁴⁰

III. THE TECHNICAL RULES SHOULD BE AMENDED

5G Americas supports Qualcomm’s proposal to relax the out-of-band emissions (OOBE) limits of CBSDs and end user devices in the 3.5 GHz band.⁴¹ This range has been identified by

³⁸ See T-Mobile Petition at 13, 14; CTIA Petition at 9-11

³⁹ See T-Mobile Petition at 19-20; CTIA at 11-12.

⁴⁰ See T-Mobile Petition at 20; CTIA at 11-12.

⁴¹ See Letter from Dean R. Brenner, Senior Vice President, Spectrum Strategy and Technology Policy, and John W. Kuzin, Vice President and Regulatory Counsel, Qualcomm, to Marlene H. Dortch, Secretary, Federal Communications Commission, GN 12-354 (June 19, 2017) (“Qualcomm Letter”).

3GPP for the 5G New Radio.⁴² To increase speed and capability, 3GPP recommends channelization for 5G with bandwidths greater than 10 MHz.⁴³ 4G LTE deployments often use channelization of 20 MHz⁴⁴. Under current Part 96 OOB limits, devices using a 20 MHz bandwidth are required to implement 4 dB and greater additional maximum power reduction.⁴⁵ In the mid-range, bandwidths of 40 – 50 MHz are ideal for 5G applications. The Commission’s current OOB limits would require both 4G LTE and 5G NR devices operating with channel bandwidths greater than 10 MHz to back-off in power, thereby reducing the quality of mobile broadband service for consumers. 5G Americas agrees with Qualcomm that the current rules, requiring the transmit power level for 20 MHz operations to be reduced by 4 dB, would significantly diminish signal coverage, the quality of service, and the usefulness of the band for mobile operations. Accordingly, 5G Americas agrees with Qualcomm that the Commission should revise its Part 96 rules for the band to support 4G LTE and 5G NR channels wider than 10 MHz, such as 20 and 40 MHz channels.

IV. CONCLUSION

The Commission’s rules for this globally harmonized range should optimize 5G deployment. As Chairman Pai has noted, the U.S. must lead the world in 5G.⁴⁶ Accordingly, revisions to the Part 96 rules should encourage 5G investment in this band, while also ensuring

⁴² See, e.g., Qualcomm post; available at <https://www.qualcomm.com/news/onq/2017/07/20/discussing-5g-spectrum-capitol-hill>

⁴³ See *Mobile Broadband Transformation: LTE to 5G*, Rysavy Research and 5G Americas (August 2016) at 73; see also *Framework and overall objectives of the future development of IMT for 2020 and beyond*, INTERNATIONAL TELECOMMUNICATIONS UNION, ITU-R M.2083, available at https://www.itu.int/dms_pubrec/itu-r/rec/m/R-REC-M.2083-0-201509-I!!PDF-E.pdf.

⁴⁴ *Mobile Broadband Transformation: LTE to 5G* at Figure 31.

⁴⁵ See Qualcomm Letter.

⁴⁶ See CTIA Petition at n.7.

the near-term availability of the band in the U.S., so we can continue to lead our Region and the world. For these reasons, 5G Americas supports the key aspects of T-Mobile's Petition discussed above, as well as CTIA's Petition and Qualcomm's proposal to relax the OOB limits currently in Part 96 for devices operating in the 3550-3700 MHz range.

Respectfully submitted,

A handwritten signature in black ink that reads "Chris Pearson". The signature is written in a cursive, flowing style.

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