

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

In the Matter of)	
)	
Use of Spectrum Bands Above 24 GHz For Mobile Radio Services)	GN Docket No. 14-177
)	
Establishing a More Flexible Framework to Facilitate Satellite Operations in the 27.5-28.35 GHz and 37.5-40 GHz Bands)	IB Docket No. 15-256
)	
Petition for Rulemaking of the Fixed Wireless Communications Coalition to Create Service Rules for the 42-43.5 GHz Band)	RM-11664
)	
Amendment of Parts 1, 22, 24, 27, 74, 80, 90, 95, and 101 To Establish Uniform License Renewal, Discontinuance of Operation, and Geographic Partitioning and Spectrum Disaggregation Rules and Policies for Certain Wireless Radio Services)	WT Docket No. 10-112
)	
Allocation and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz and 48.2-50.2 GHz Frequency Bands; Allocation of Spectrum to Upgrade Fixed and Mobile Allocations in the 40.5-42.5 GHz Frequency Band; Allocation of Spectrum in the 46.9-47.0 GHz Frequency Band for Wireless Services; and Allocation of Spectrum in the 37.0- 38.0 GHz and 40.0-40.5 GHz for Government Operations)	IB Docket No. 97-95

COMMENTS OF AT&T

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TABLE OF CONTENTS

	<u>Page</u>
I. INTRODUCTION & SUMMARY.....	1
II. AT&T APPLAUDS THE COMMISSION’S EFFORTS TO ALLOCATE ADDITIONAL SPECTRUM TO PROMOTE 5G WIRELESS SERVICES.....	3
III. THE REGULATORY STRUCTURE FOR 5G NETWORKS AND SERVICES SHOULD BE GUIDED BY SEVERAL KEY FOUNDATIONAL PRINCIPLES.	5
IV. APPLYING THESE FOUNDATIONAL PRINCIPLES TO THE NEWLY PROPOSED ALLOCATIONS.	8
A. Additional Spectrum Allocations.....	9
B. Channel Sizes.....	9
C. Exclusive Use Licensing.....	11
D. License Area and Term.....	13
E. Fixed Satellite Service/Mobile Sharing	14
F. Cybersecurity Certifications	14
V. CONCLUSION.....	16

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COMMENTS OF AT&T

I. INTRODUCTION & SUMMARY

AT&T Services Inc. (“AT&T”), on behalf of the subsidiaries and affiliates of AT&T Inc. (collectively, “AT&T”), hereby submits the following comments in response to the Federal Communications Commission’s (“Commission”) Further Notice of Proposed Rulemaking

(“*FNPRM*”) in the above captioned proceeding.¹ The *FNPRM* proposes to make additional millimeter wave (“mmW”) spectrum bands above 24 GHz available for mobile operations and proposes a number of service rules for the added bands. The *FNPRM* is the latest step in the Commission’s efforts to facilitate fifth generation (“5G”) wireless services. As discussed below, AT&T applauds the Commission for releasing the *FNPRM* and taking this necessary step toward fostering a thriving ecosystem for 5G networks and services.

The Commission must continue its momentum and act expeditiously to allocate additional spectrum for 5G networks and services and craft spectrum policies that will cement the United States’ preeminent role in wireless. The mmW spectrum the Commission proposes to unleash for mobile uses in this proceeding will help foster 5G innovation and change the way consumers experience mobile. As commenters and the Commission have recognized, 5G will enable the Internet of Things (“IoT”) to flourish, introducing an unprecedented level of connectivity into everyday life. Smart cities, telemedicine, connected cars, smart grids, and beyond will all be possible. To fully realize this vision, however, AT&T previously set forth certain foundational principles it believes should guide future 5G allocations and service rules. These core principles are guideposts that will serve to drive next generational development. Specifically, the 5G environment will need to support integrated network design; promote innovative technologies; facilitate new services; contemplate a variety of use cases covering a wide range of geography; provide large channel bandwidths; prioritize international harmonization; and, encourage investment. By incorporating these principles into the regulatory

¹ *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, Report & Order and Further Notice of Proposed Rulemaking, FCC 16-89 (July 14, 2016) (“Report & Order” or “FNPRM” as appropriate).*

framework for any newly allocated bands, the Commission will ensure the rapid deployment of a vibrant and successful 5G ecosystem.

II. AT&T APPLAUDS THE COMMISSION’S EFFORTS TO ALLOCATE ADDITIONAL SPECTRUM TO PROMOTE 5G WIRELESS SERVICES.

The mmW spectrum the Commission proposes to reallocate for mobile use in this proceeding will help support a thriving ecosystem for the next generation of wireless services. 5G networks and services are expected to revolutionize the mobile experience.² As Chairman Wheeler recently noted, “5G is like the missing piece of the puzzle depicting the wireless future . . . 5G’s promise of gigabit mobile connections at any location will open up hugely disruptive new value propositions for the users of networks.”³ Wireless visionaries expect 5G services to utterly transform everyday life into a seamless connected experience, from cars, to homes, to cities, and beyond. AT&T’s own initial 5G lab trials have demonstrated 5G’s high speeds and low latency, which are positive signs for future consumer experiences, such as self-driving cars and augmented reality, as well as for commercial users, for applications such as remote tele-medicine or real-time asset tracking.⁴ 5G technologies “could lead to the emergence of a new and radically more capable generation of wireless mobile service,”⁵ to the benefit of consumers and businesses all over the country. With 5G, the wireless industry can write the next chapter of

² *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Notice of Proposed Rulemaking, 30 FCC Rcd 11878 ¶ 8 (2015) (“*NPRM*”).

³ Remarks of FCC Chairman Tom Wheeler, CTIA Super Mobility Show 2016 (Sept. 7, 2016) (“Sept. 7, 2016 Wheeler Remarks”).

⁴ AT&T, Press Release, AT&T Highlights Progress in 5G Lab Trials, New Markets and Vendors (June 6, 2016) *available at* http://about.att.com/story/att_highlights_progress_in_5g_lab_trials_and_new_markets.html.

⁵ *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Notice of Inquiry, 29 FCC Rcd 13020 (2014) (“*NOI*”).

the mobile evolution that has already transformed our lives and society and unleash new waves of innovation. Indeed, “5G is not a technology. It is a revolution.”⁶

AT&T commends the Commission for taking steps to make additional mmW spectrum available to support 5G. As the Commission noted, “[m]oving quickly to make this spectrum available in the near term will best enable potential users, technology developers, and innovators to have relative certainty about the spectrum structure in the mmW bands.”⁷ Further, the actions the Commission takes now will positively impact the United States’ leadership role in wireless innovation in the future.

But “5G” and “mmW spectrum” are not, and should not be, synonymous. To fully realize the potential for 5G, these networks will require multi-band implementation with a mix of low-, mid-, and high-band capacity. Thus, while AT&T commends the FCC’s efforts with respect to mmW spectrum, it should not lose sight of the need to continue to allocate more spectrum below 6 GHz. The high frequency spectrum contemplated in the *FNPRM* alone is not an all-purpose solution to the spectrum front confronting wireless providers. Without additional spectrum, particularly spectrum below 6 GHz, wireless coverage and capacity may fall behind. A key priority must be to make more spectrum in these low bands available. In so doing, the Commission can foster the evolution of 4G systems into 5G technologies. Accordingly, AT&T urges the Commission to keep in mind the paramount need to unleash additional spectrum to support 5G.

⁶ Sept. 7, 2016 Wheeler Remarks.

⁷ *FNPRM* ¶ 7.

III. THE REGULATORY STRUCTURE FOR 5G NETWORKS AND SERVICES SHOULD BE GUIDED BY SEVERAL KEY FOUNDATIONAL PRINCIPLES.

5G systems will be utterly unlike their predecessors, harnessing both revolutionary and evolutionary technologies to transform existing notions of connectivity. Ultra-high data rates and reliability coupled with ultra-low latency will characterize 5G systems, integrating mobile services into nearly every aspect of daily life. As industry and the Commission move forward with developing 5G systems, several key principles have emerged that will help shape the ultimate deployment of 5G networks and services. Indeed, the Commission’s efforts to date in making additional spectrum available in the *Report & Order* accompanying the *FNPRM* encapsulate many of these principles, such as the need for large channel bandwidths.⁸ Appreciating and incorporating these principles will be essential for setting successful 5G spectrum policies. The Commission should adopt a 5G regulatory framework consistent with the foundational principles enumerated below to help ensure that 5G reaches its full potential quickly.

Support Integrated Network Design. 5G will embody wholly new network designs to create a new ecosystem for mobile communications. The next generation of mobile contemplates a heterogeneous environment of networks relying on a number of spectrum bands and technologies for operation. For example, unlike its predecessors, 5G will not consist of a single Radio Access Technology (“RAT”). Instead, 5G services will be supported by a combination of existing RAT and new RATs optimized for specific deployments and use cases.

Dense small cell deployments in particular will play a key role in 5G network design. Small cell deployments are often used to provide wireless connectivity in areas, such as dense

⁸ See, e.g. *Report & Order* ¶ 72 (licensing the 28 GHz band in 425 MHz blocks).

urban areas, that present coverage and capacity challenges to traditional networks. At the same time, initial 5G use cases may support backhaul and fixed broadband wireless operations. It follows that spectrum policies will need to permit efficient and manageable coordination between various types of network deployments.

Promote New Technologies. As the Commission has recognized, technology advances are paving the way for “unlocking mmW bands for mobile and other operations in a way that meets the need for flexible access to spectrum to improve bandwidth in constrained geographies.”⁹ Technological advancements will help the industry achieve the revolutionary network architecture that 5G demands. The Commission should strive to develop a 5G framework that promotes new and innovative technologies.

Three technologies in particular—massive multiple input, multiple output (“MIMO”) with adaptive beamforming, flexible low latency radio protocol design, and an access agnostic software defined core network—will all play a role in 5G network deployment. Indeed, as the Commission has recognized, the use of innovative MIMO antenna schemes and adaptive beamforming may help overcome “some of the challenging propagation characteristics of mmW bands and could increase efficiency, allow for higher data rates, and provide reasonable coverage for mobile broadband services.”¹⁰ The regulatory framework adopted in this proceeding should adhere to the principle of promoting innovation.

Facilitate New Services. To reach its full potential, 5G will need to embrace new services including enhanced mobile broadband, unmanned vehicles, telemedicine, ultra-reliable communications, and beyond. Some of these new services could not be imagined with the

⁹ *FNPRM* ¶ 6.

¹⁰ *NOI* ¶ 18.

traditional wireless technology available today. These innovative services hold the promise of changing the way consumers think of wireless mobility. To achieve the benefits of unleashing new services, the Commission should be mindful of creating a regulatory environment that prioritizes flexibility and simplicity.

Contemplate Different Use Cases & Geography. 5G use cases and services are still being developed.¹¹ 5G deployments will be driven by small cell network builds, meaning that urban and rural use cases may differ significantly. Sound spectrum policy should account for these variances, adopting an approach that fits with all anticipated 5G use cases and services. As 5G service remains undefined and standards have not been completed, the Commission should not, at this time, adopt technical rules or performance requirements that may be preclusive of use cases that are not yet understood. Flexibility is key for innovation as these services take shape.

Maintain Large Channel Bandwidths. Allocations of large, contiguous channels will be necessary to support 5G's expected level of performance—200 MHz at minimum, with even larger blocks where possible.¹² Large channels will be required to attain the data speeds and meet the capacity requirements expected of wireless 5G uses, with such larger channel bandwidths optimizing traffic management and improving system performance. In addition, by facilitating higher throughput, wideband channels will permit more users to simultaneously utilize the band. Wide spectrum channels will enable 5G to thrive.

Promote International Harmonization. The transition to 5G systems will be a global revolution, requiring international efforts to bring 5G services to achieve their full potential.

¹¹ See Nokia Solutions and Networks, 5G Use Cases and Requirements at 8 (2014), available at http://networks.nokia.com/sites/default/files/document/5g_requirements_white_paper.pdf (“Nokia 5G Use Cases White Paper”).

¹² See *Report & Order* ¶ 72 (licensing the 28 GHz block as two 425 MHz channels).

Retaining global harmonization will be critical to incentivizing investment in the spectrum bands above 24 GHz and 5G technologies. International harmonization reduces equipment cost, promotes greater economies of scale, and makes the use of 5G services outside of the United States more accessible. Further, in light of the United States' leadership in 5G and promoting spectrum in the mmW bands for ensuing 5G deployments, the Commission should appropriately take into account how the regulatory choices of a technical nature it makes in this proceeding could be adopted by other countries in the same bands to promote harmonization. To reap the full advantages of economies of scale, both spectrum band allocations and licensing frameworks will need to be internationally harmonized.

Incentivize Investment. The Commission should be careful to avoid adopting policies that could deter investment, an outcome that would stymie 5G development from the start. Realizing the benefits of 5G will require an upfront investment in networks—including a significant investment in deployment of small cell networks—and development of new technologies. A stable regulatory environment will help spark this investment. Adopting exclusive use licensing will provide innovators with a stable environment in which to experiment with novel 5G services and incentivize investment.

IV. APPLYING THESE FOUNDATIONAL PRINCIPLES TO THE NEWLY PROPOSED ALLOCATIONS.

The *FNPRM* seeks comment on authorizing fixed and mobile use of several mmW bands and proposes service rules for the new allocations. The Commission can most effectively support 5G advancement by adopting a regulatory approach rooted in the foundational principles identified by AT&T in Section III. Together with these guideposts, the Commission should prioritize simplicity and encourage competition and efficiency with the mmW bands. A

regulatory approach rooted in the foundational principles will help promote a vibrant wireless ecosystem for the next generation of technology.

A. Additional Spectrum Allocations

To achieve the innovative prospects of 5G, mobile service providers will need more spectrum, and lots of it. The Commission proposes to adopt service rules allowing flexible fixed and mobile uses in several additional bands: 24.25-24.45 GHz and 24.75-25.25 GHz (“24 GHz band”), 31.8-33.4 GHz (“32 GHz band”), 42-42.5 GHz (“42 GHz band”), 47.2-50.2 GHz (“47 GHz band”), 50.4-52.6 GHz (“50 GHz band”), 71-76 GHz, and 81-86 GHz (“70/80 GHz bands”).¹³ All of the spectrum bands identified in the *FNPRM* hold potential for 5G networks and services and AT&T supports reallocation and modification of the allocation status of all of the identified bands to render them suitable for 5G licensed services. Making these additional spectrum bands available for mobile use will further accelerate the deployment of 5G.

B. Channel Sizes

Consistent with the general principles identified by AT&T in Section III, the FCC should strive to accommodate the largest channel sizes in the proposed bands consistent with licensee diversity. The need for large channel bandwidths is driven by the technical requirements for 5G and the predicted explosive growth in traffic. Notably, ITU Recommendations indicate that there will be a greater than 10x increase in peak data rate to >10 Gbps, and a 10x increase in average experienced user throughput to 100 Mbps.¹⁴ Increases in spectral efficiency alone will

¹³ *FNPRM* ¶ 373.

¹⁴ ITU, Recommendation ITU-R M.2083-0, IMT Vision – Framework and Overall Objectives of the Future Development of IMT for 2020 and Beyond, at 14 (Sept. 2014), available at https://www.itu.int/dms_pubrec/itu-r/rec/m/R-REC-M.2083-0-201509-I!!PDF-E.pdf.

not be sufficient to deliver the required ultra-high throughputs; rather, ultra-wide bandwidths of 200 MHz or more will be necessary.

Demand for data applications and connected devices is also expected to multiply. Already, Americans are using more than 8.8 billion MB of data every day.¹⁵ Estimates project that the demand for mobile data will grow by a factor of 1,000x to 10,000x as 5G is unveiled.¹⁶ Network densification gains and spectral efficiency improvements alone will not accommodate this projected increase in demand. Wider channels permitting high capacity will be essential.

Further, large channels are also necessary to optimize traffic management. Extensive carrier aggregation to meet demand would come at a cost in terms of power consumption, equipment complexity, and system performance. In addition, device power consumption is reduced when working with a single wideband carrier rather than multiple narrow bands. Promoting efficient power consumption will be critical to sustaining the new 5G environment. Further, large channel sizes will be needed to support the peak data rates expected with 5G services.

In such regards, the Commission should be careful to avoid squandering the opportunity to create large blocks in these bands by thinking a “small building blocks” model will allow for necessary assemblage. With the benefit of 20/20 hindsight, the Commission’s prior reliance on the “small building blocks” concept put the United States at a disadvantage vis-à-vis Europe and Asia—where larger blocks were licensed—in the deployment of 4G. While the United States eventually was able to overcome this setback, rationalization of spectrum holdings to create

¹⁵ CTIA, Infographic: Americans’ Data Usage Equals 13 Round Trips to the Moon Every Minute (Dec. 2014) *available at* <http://www.ctia.org/resource-library/facts-and-infographics/archive/infographic-americans%27-data-usage-equals-13-round-trips-to-the-moon-every-minute>.

¹⁶ Nokia 5G Use Cases White Paper at 6.

larger blocks has been administratively difficult, imposed significant transaction costs and may have delayed the introduction of faster network speeds for the American public. Rather than starting at a disadvantage in deploying 5G, the Commission should prioritize the establishment of larger channel sizes in the newly allocated spectrum.

C. Exclusive Use Licensing

AT&T identified “encouraging investment” as a foundational principle for allocating 5G spectrum. Exclusive use licensing is a key way to give investors the confidence to proceed with investing in deployment of 5G networks. The *Report & Order* was an immense stride forward for 5G services, but of the 11.65 GHz of spectrum allocated, only about 20% was allocated for licensed use. In this proceeding, the Commission should prioritize exclusively licensed spectrum. In particular, the Commission should not assume that higher bands will never work for exclusively licensed services and, in a haste to promote experimentation, rush to designate the bands for unlicensed operation. Technology is changing rapidly, and the baseline assumptions for technology capabilities today may not be the same tomorrow. There are, especially in the wake of the recent Spectrum Frontiers *Report & Order*, sufficient assets available for unlicensed experimentation, and the FCC should not preclude the benefits of licensed use by prematurely adding to an already significant unlicensed spectrum pool.

In addition, while AT&T understands that some sharing in the newly allocated bands will be required, the Commission should continue to engage in all necessary technical and engineering efforts to secure exclusively licensed spectrum. And, where sharing is required, the Commission should not view Spectrum Access System (“SAS”) concepts as a panacea. While the SAS concept has been portrayed as a technological enabler, the reality is that the model is still untested, and there are already significant issues coming to the fore as industry struggles with SAS implementation for the 3.5 GHz band. Instead, the Commission should look to tested

industry/government sharing models—including those adopted in the AWS-3 proceeding,¹⁷ the use of coordination and preclusion zones, and the use of prior coordination notice processes. In the sharing context, the Commission cannot equate its relatively successful reliance on impartial spectrum coordinators with the rather different model of a SAS system enabling direct access to spectrum, especially where the SAS may be self-interested.

Opportunistic sharing, in fact, has not been successfully deployed on any large scale basis and prior attempts to develop opportunistic sharing have failed. For example, in the interference temperature proceeding, the Commission proposed “a fundamental paradigm shift in the Commission’s approach to spectrum management” by specifying a new model to measure interference which would help identify opportunities for additional transmitters to operate in currently licensed bands.¹⁸ Ultimately, the Commission terminated the proceeding without taking action on the proposals, noting that “[c]ommenting parties generally argued that the interference temperature approach is not a workable concept.”¹⁹ Deploying 5G systems will be difficult; adding an additional layer of complexity with untested sharing mechanisms may make the endeavor even more time-consuming and costly.

¹⁷ *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands*, Report & Order, 29 FCC Rcd. 4610 (2014).

¹⁸ *Establishment of an Interference Temperature Metric to Quantify and Manage Interference and to Expand Available Unlicensed Operation in Certain Fixed, Mobile and Satellite Frequency Bands*, Notice of Inquiry and Notice of Proposed Rulemaking, 18 FCC Rcd 25309 ¶¶ 1, 16 (2003).

¹⁹ *Establishment of an Interference Temperature Metric to Quantify and Manage Interference and to Expand Available Unlicensed Operation in Certain Fixed, Mobile and Satellite Frequency Bands*, Order, 22 FCC Rcd 8938 ¶ 2 (2007).

D. License Area and Term

The Commission should license the newly allocated spectrum using Partial Economic Areas (“PEAs”). These regions are large enough to allow for rational development of networks in regions, and are consistent with recent licensing decisions by the FCC in, for example, the 600 MHz band.²⁰ A county-based licensing approach would be suboptimal for several 5G use cases. Smart grids, telemedicine, smart cities, connected cars, and the IoT will not be confined by small and arbitrary county boundaries. These innovative 5G services will permeate larger geographic areas, and consumers will expect a seamless experience. Moreover, a county-based licensing approach would require extensive and burdensome interference coordination efforts, as licensees would be forced to coordinate across numerous neighboring counties. Use of PEAs would minimize these concerns.

In the *Report & Order*, The Commission adopted a 10-year license term for all UMFUS licenses with a renewal expectancy for subsequent license terms if the licensee continues to provide at least the initially-required level of service.²¹ To maintain consistency, the license term in any newly allocated bands should likewise be 10 years. As the Commission noted, “a 10-year license term will give licensees sufficient certainty to invest in their systems, particularly as the new technology is still nascent and will require time to fully develop.”²² A 10-year license term is also consistent with existing license terms in a wide variety of other mobile services.²³

²⁰ *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Report & Order, 29 FCC Rcd 6567 ¶ 71 (2014).

²¹ *Report & Order* ¶ 176.

²² *Id.*

²³ *See, e.g.* 47 C.F.R. §§ 24.15 (10 year license period for personal communications services licenses); 27.13 (10 year license period for many wireless communications services licenses).

E. Fixed Satellite Service/Mobile Sharing

The Commission seeks comment on the best way to promote effective sharing between satellite and mobile uses.²⁴ To accomplish this goal, AT&T recommends that the FSS/mobile sharing model adopted in the 28 GHz band²⁵ be extended to the other 5G bands, including 24 GHz. As the only FSS licensee in 24 GHz, AT&T/DTV has evaluated sharing models and believes the model adopted in the 28 GHz band best accommodates all users of the band while minimizing the risk of interference. Extending the existing rules, which prohibit the licensing of any FSS feeder link in the 25.05-25.25 GHz band in any area where there is a terrestrial licensee,²⁶ to apply across the entire 24.75-25.25 GHz band would be overly restrictive and would likely result in precluding necessary new FSS feeder links in the band. Instead, the existing rules should simply be replaced in their entirety with the construct developed for UMFUS/FSS sharing in the former Local Multipoint Distribution Service (“LMDS”) bands. The 28 GHz model should be considered in the other bands designated for 5G as well, to the extent that such bands implicate potential FSS uplink use.

F. Cybersecurity Certifications

In the Spectrum Frontiers *NPRM*, the Commission asked general, open-ended questions on industry cybersecurity practices and the utility of security by design.²⁷ The Commission did not propose a specific rule, but merely asked “[w]hat, if any, action the Commission should take”

²⁴ *FNPRM* ¶ 384.

²⁵ *Report & Order* ¶¶ 45-47.

²⁶ *See* 47 C.F.R. § 25.203(1).

²⁷ *NPRM* ¶¶ 260-65.

to protect the confidentiality of user communications and data.²⁸ The *Report and Order* nonetheless adopts a rule imposing a mandatory certification from a senior company executive prior to 5G deployment with a number of descriptions relating to the licensee’s security planning and operations, while also foreshadowing the launch of a broad new proceeding on cybersecurity.²⁹ There is no justification for the rule adopted by the FCC, and industry efforts obviate the need for FCC mandates in this evolving aspect of network planning and execution.

As CTIA has observed, the “FCC has long supported industry leadership and working groups like the Communications Security, Reliability and Interoperability Council (‘CSRIC’) to address evolving and highly technical issues affecting the entire global ecosystem,”³⁰ and AT&T believes it is imperative to continue to do so going forward. The *Report and Order* cites numerous manufacturers’ and standards organizations’ comments about the overall importance of cybersecurity,³¹ but never acknowledges that such comments were made in the context of discussing how the industry was intensely focused on security-by-design and ensuring the well-being of end-users in complex digital domains. Efforts to overlay regulation—even well-meaning regulation mistakenly thought to be less intrusive—will always have unintended consequences, and those consequences could be even more dire in an environment where technology, use cases, and applications are evolving at a rapid pace. Such regulations also raise questions of differential impact, since they are focused on only network providers, whereas cyber threats can and do originate more commonly through other, unregulated, mechanisms. 5G

²⁸ See *NPRM* ¶ 262.

²⁹ *Report & Order* ¶¶ 262-65.

³⁰ CTIA, Notice of *Ex Parte* Presentation, GN Docket No. 14-177 *et al.* (filed May 23, 2016).

³¹ See *Report & Order* ¶¶ 259-61.

network design is still emerging through standards bodies and global private sector efforts. Security in such an evolving setting will not remain static; companies need flexibility to adjust—not mandates that cultivate a compliance mindset. Finally, given the complexities of 5G networks, evaluating the sufficiency of cybersecurity measures is well outside the FCC's core competencies, and is a task better suited to the security professionals that are already engaged in exactly the type of pre-planning the Commission seems to want. On that basis, and in light of work throughout the entire ecosystem, AT&T believes that attempting to regulate cybersecurity through narrow regulation of carriers is a path that has tremendous potential cost with no public interest benefit.

V. CONCLUSION

AT&T applauds the Commission for proposing flexible use rules that would authorize additional mmW spectrum bands for important mobile uses. The Commission's successful spectrum policies to date have supported the United States' rise as the leader in 4G wireless technologies and services. To secure the nation's leadership role for 5G services, the Commission should adopt a regulatory framework consistent with the fundamental principles AT&T has outlined in this proceeding. By adhering to these core concepts and championing regulatory simplicity, the Commission will foster a stable regulatory environment that allows investment and innovation to flourish.

Respectfully submitted,

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