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

In the Matter of

The Office of Engineering & Technology and the Wireless Telecommunications Bureau Seek Comment on Emissions Limits for the 24.25-27.5 GHz Band
Use of the Spectrum Bands Above 24 GHz for Mobile Radio Services

ET Docket No. 21-186
GN Docket No. 14-177

REPLY COMMENTS OF AT&T SERVICES, INC.

AT&T Services, Inc., on behalf of itself and its affiliates (collectively, “AT&T”), hereby submits the following reply to comments in response to the Public Notice issued by the Federal Communication Commission’s (“Commission” or “FCC”) Office of Engineering and Technology (“OET”) and Wireless Telecommunications Bureau (“WTB”) seeking comment on aligning the Commission’s rules with a 2019 decision of the World Radiocommunication Conference (“WRC-19”) regarding protection of the passive 23.6-24.0 GHz band (“23 GHz band”). ¹ More specifically, the Public Notice seeks comment on potential rule changes and related implementation timelines to restrict emissions into that passive band emanating from the operations of 24.25-27.5 GHz Upper Microwave Flexible Use Service (“UMFUS”) licensees. As discussed below, AT&T agrees with NTIA and other commenters supporting the need to

align the FCC’s domestic regulations with Resolution 750, and believes the record demonstrates that the Total Radiated Power (“TRP”) limits of Resolution 750 will provide more than sufficient protection for Earth Exploration Satellite Services (“EESs”), as well as Radio Astronomy (“RA”) and Space Research Services, in the 23 GHz passive band.

In particular, AT&T broadly agrees with the approach defined in the comments of CTIA, Qualcomm, and T-Mobile with respect to implementation of Resolution 750 and the appropriate modifications to the FCC’s UMFUS rules. As these commenters discuss, the FCC took a reasoned approach in initially determining the -13 dBm/MHz (-20 dBW/200 MHz) out of band emission (“OOBE”) limit in the 24 GHz Report & Order, and the -13 dBm/MHz limit is consistent with other operations surrounding the 23 GHz passive band and should protect EESS operations. This is especially compelling in light of engineering expectations of signal power

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roll-off as a result of the spectral separation between 5G UMFUS operations and the 23.6-24.0 GHz band, which was the U.S. position at WRC-19.  

In contrast, Resolution 750 specifies the amount of emissions permissible in any 200 MHz sub-band of the 23.6-24.0 GHz band from the UMFUS bands in terms of TRP. Two limits are specified—a limit of 33 dBW for “IMT Base Stations” and 29 dBW for “IMT Mobile Stations” that will apply now (“Phase I”), and a 6 dB more stringent set of limits that will apply after September 1, 2027 (“Phase II”). As discussed below, although specific rule changes may not be necessary given the existing OOBE limit and the spectral separation, the U.S.’s leadership at WRC-19 led to a reasoned decision that fully protects EESS while still allowing for 5G deployment. Therefore, as an overarching matter, the existing OOBE limits could be supplemented with the TRP limits of Resolution 750, but the Commission should not attempt to accelerate or impose restrictions beyond the Resolution 750 limits.

First, AT&T concurs with the commenters suggesting that Resolution 750 should be implemented consistent with its terms, which are more than sufficient to protect passive services in the 23.6-24.0 GHz band. At the outset, based on the submissions by network and user equipment manufacturers, the record does not show that compliance with the Phase I limits is infeasible. AT&T’s planning for 24 GHz, accordingly, is designed to meet all Phase I

5 CTIA Comments at 5 (noting “the Commission’s existing OOBE limits are sufficient to protect EESS operations from interference”); Qualcomm Comments at 1 (noting “the FCC’s current -13 dBm/MHz unwanted emissions limit that applies below the lower 24.25 GHz edge of the 24 GHz UMFUS band . . . provides adequate interference protection of the [EESS] passive systems in the 23.6-24.0 GHz band”); T-Mobile Comments at 4-5 (noting “[t]he current UMFUS rules were appropriate when they were adopted, and they remain appropriate today” and that no commenters—including the National Academy of Sciences’ Committee on Radio Frequencies—argued during the relevant UMFUS rulemaking proceeding that more than the -13 dBm/MHz OOBE limit was necessary to protect EESS).

6 Ericsson Comments at 1-2; Nokia Comments at 1-2; Qualcomm Comments at 1-2.
requirements and, importantly, implementation of Resolution 750 will not delay the deployment of 5G services using UMFUS spectrum in the 24 GHz bands. At the same time, as OET and WTB are aware, the compliance requirements for Phase II are significantly more restrictive and a two-phase approach is fully warranted. Based on the record, compliance with the Phase II TRP limits will require significant research and development work,\(^7\) and therefore OET and WTB should reject the request by CORF and GRSS to accelerate the Phase II deadlines,\(^8\) as well as their even more drastic suggestion to override the U.S. position and world-wide decisions at WRC-19 and enact limits more stringent than found in Resolution 750.\(^9\)

Similarly, the Commission should reject NTIA’s ambiguous language triggering the Phase II requirements when base station or user equipment is “modified or replaced.”\(^10\) Resolution 750, and NTIA’s own language in its Proposed Section 30.203(d)(1), refer to base stations and user equipment “brought into use,” which seems, on its face, to clearly refer to the activation of new 24 GHz transmitter equipment.\(^11\) Base stations, however, are potentially “modified” whenever frequency assignments change, backhaul arrangements altered, software updated, or antenna reconfiguration performed—none of which could be related to the 24 GHz

\(^{7}\) Ericsson Comments at 3; Nokia Comments at 2; Qualcomm Comments at 2.


\(^{9}\) No purpose is served by adopting more stringent limits than those advocated by the U.S. at WRC-19 and those adopted in Resolution 750. Neither CORF nor GRSS has provided any tangible, empirical evidence that the limits set forth in Resolution 750 would harm EESS operations. Indeed, adopting more stringent limits for 24-27 GHz terrestrial services in the U.S. could substantially impair the roll-out of 5G services and threaten the U.S.’s ability to maintain a leadership role in 5G globally.

\(^{10}\) NTIA Comments at Attachment, p. 1 (proposed modification to Section 30.203(d)(3)).

\(^{11}\) Id. (proposed modification to Section 30.203(d)(1)); Resolution 750 at 2.
transmitter. Similarly, end user equipment could conceivably be “modified” if the software is updated or even if the user downloads an “app.” Under these circumstances, NTIA’s suggested Section 30.203(d)(3)(i) and (d)(3)(ii) are unnecessary and potentially contrary to the U.S. position at WRC-19 and the Resolution as adopted.

Second, based on the comments of Nokia, Qualcomm and Ericsson, a TRP-based limit appears feasible for compliance with Phase I and Phase II requirements. AT&T will work with its vendors to assure that its network being deployed on 24 GHz spectrum can be validated as complying with the Resolution 750 limits through direct TRP measurements. AT&T does, however, submit that if difficulties arise with respect to the ability to measure very lower power TRP values, it would be beneficial to have alternative compliance validation schemes on the books. As Ericsson states, there are today no physical connectors that would allow conducted measurements for compliance testing in devices, and at the same time, there also appears to be little downside to permitting alternative compliance schemes that may be more feasible to utilize in the future as equipment evolves.\textsuperscript{12}

Like other commenters, AT&T does not believe the Resolution 750 limits should be extended beyond their express terms—terms that are intended for outdoor wide area mobile

\textsuperscript{12}Ericsson Comments at 3; \textit{compare} Nokia Comments at 2; CTIA Comments at 7-8. Although AT&T is encouraged by the concepts presented on the record regarding other mitigation techniques to further attenuate the impact of mobile systems on EESS, the record does not present any compelling need to modify the proposed rules at this time. One commenter noted that MIMO systems might be engineered to reduce emissions above some nominal downtilt, and another commenter proposed a real-time geospatial sharing system that appears to rely on enhanced network management to reduce potential EESS interference. Although both technologies have some logical promise in protection of EESS, there is no need to modify the proposed regulatory scheme for implementation of Resolution 750—the Commission can permit such technologies under waiver authority if and when the technologies are fully developed and tested. \textit{See} Northeastern University Comments; Response to Request for Comments of Elliot Eichen, Choyu Networks, ET Docket No. 21-186, GN Docket No. 14-177 (dated June 28, 2021).
networks.\textsuperscript{13} As the \textit{Public Notice} observes, the UMFUS rules permit deployment of systems falling outside of the wide-area mobile systems envisioned globally for the UMFUS spectrum that has been allocated in the United States.\textsuperscript{14} For example, the UMFUS rules permit roll-out of potential non-IMTS services, including fixed wireless applications like point-to-point and point-to-multipoint communications. These types of systems—especially given the limited propagation above the 24 GHz band and the need for highly directional antennas—raise significantly less interference issues than the mobile networks subject to Resolution 750. Under the circumstances, the Resolution 750 criteria should not be applied to U.S. UMFUS deployments that do not parallel the types of systems referenced in Resolution 750. Indeed, the interference potential of 24 GHz UMFUS-based fixed wireless systems is no more significant than potential interference from the FS systems that currently exist below the 23.6-24.0 GHz band—systems with which EESS has co-existed for years.\textsuperscript{15}

AT&T also concurs with Ericsson that the derivation of the Resolution 750 limits did not consider the substantial added attenuation from indoor, small cell networks due to building penetration loss.\textsuperscript{16} Not only will there be significant loss of signal power as indoor networks pass through exterior walls, the power of systems intending to serve indoor areas will be lower than the power used for outdoor 5G networks. As a result, indoor small-cell systems pose no

\textsuperscript{13} Ericsson Comments at 4-6; Qualcomm Comments at 1; T-Mobile Comments at 6-8.

\textsuperscript{14} \textit{Public Notice} at 4.

\textsuperscript{15} Although CORF vaguely alleges that these bands are responsible for some non-quantifiable impact on EESS, no studies have been presented demonstrating that fixed systems pose any threat to EESS. CORF Comments at 13-14 (noting “CORF cannot verify whether or not these point-to-point links have caused harmful interference to passive sensors at 23.6–24.0 GHz”).

\textsuperscript{16} Ericsson Comments at 4-6.
tangible threat to EESS and such indoor systems should, accordingly, not be included in the Resolution 750 limits.

As discussed in this Reply, AT&T supports the need to align the Commission’s policies with respect to Resolution 750 adopted at WRC-19. The leadership of the United States at WRC-19 resulted in limits that will fully protect passive operations in the 23.6-24.0 GHz band from unwanted emissions from UMFUS networks in the 24.25-27.5 GHz bands, without unnecessary measures that would impact the roll-out of 5G mobile services. Under these circumstances, the Commission should not undermine national policy by accelerating compliance deadlines or imposing stricter—and wholly unnecessary—limits on UMFUS networks.

Respectfully submitted,

/s/ Michael P. Goggin

Michael P. Goggin
Alex Starr
David J. Chorzempa
David L. Lawson
AT&T Services, Inc.
1120 20th Street, N.W.
Washington, D.C. 20036
202-457-2055

Attorneys for AT&T Services, Inc.

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