

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

In the Matter of

Use of Spectrum Bands Above 24 GHz for  
Mobile Radio Services

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GN Docket No. 14-177

IB Docket No. 17-172

**COMMENTS OF AT&T SERVICES, INC.**

**I. INTRODUCTION AND SUMMARY**

AT&T Services, Inc., on behalf of itself and its operating company affiliates (collectively, “AT&T”), submits these comments in response to the Public Notice issued by the International Bureau on June 21, 2017 seeking comment on satellite earth station siting methodologies in the bands above 24 GHz that recently were allocated for Upper Microwave Flexible Use Service (“UMFUS” or “UMFU services”).<sup>1</sup> In 2016, the Commission issued a Report and Order (“R&O”) in which it allocated the 28 GHz band and the 37.5-40 GHz (“39 GHz” or “37 and 39 GHz”) band for flexible terrestrial uses, including mobile wireless services, to facilitate the deployment of 5G mobile services.<sup>2</sup> In the R&O, the Commission determined to limit the deployment of satellite earth stations in these bands to three earth stations per terrestrial

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<sup>1</sup> *International Bureau Seeks Comment on Implementing Earth Station Siting Methodologies*, Public Notice, IB Dkt. No. 17-172, June 21, 2017 (“Public Notice” or “PN”).

<sup>2</sup> *Use of the Spectrum Bands Above 24 GHz for Mobile Radio Services*, Report and Order and Further Notice of Proposed Rulemaking, FCC 16-89, 31 FCC Rcd 8014 (2016) (“Spectrum Frontiers Report and Order” or “R&O”).

license area.<sup>3</sup> In addition, the R&O placed a restriction on the aggregate impact to population that earth station deployment could have in these bands. Specifically, the aggregate interference protection area around 28 GHz satellite earth stations in which a specified power flux density is exceeded must impact no more than 0.1 percent of the population of any such UMFUS license area, and the aggregate area around 39 GHz satellite earth stations within which an UMFUS licensee needs to coordinate operations with the earth station licensee must impact no more than 0.1 percent of the population of any such UMFUS license area.<sup>4</sup> In its Public Notice, the International Bureau seeks comment on the appropriate methodology to calculate the 0.1 percent population limit and best practices for earth station siting to limit the impact on UMFUS licensees.<sup>5</sup> AT&T believes that earth station applicants should be accorded some flexibility, but should use accepted engineering methods and propagation models that minimize the impact on UMFUS licensees. In addition, earth station applications should be made public in a manner that will: (i) alert other potential applicants and provide sufficient information to allow them to determine how to comply with the numeric and population limits, (ii) afford UMFUS licensees to plan deployments, and (iii) ensure that other earth station applicants and UMFUS licensees have an opportunity to challenge any unreasonable claims regarding coordination or interference

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<sup>3</sup> The 28 GHz band will be licensed on a county basis, and the 37 and 39 GHz band will be licensed on a Partial Economic Area (PEA) basis. 47 C.F.R. § 30.5.

<sup>4</sup> Spectrum Frontiers Report and Order at ¶¶ 53, 93. Although there are presently no commercial FSS earth stations operating in the 39 GHz band, there are earth stations in the 28 GHz band, and a new applicant would have to count them toward the 3 earth stations per license area limit, and include the power flux density contour of any such grandfathered earth stations in the calculation of the aggregate 0.1 percent population limit. 47 C.F.R. § 25.136(a)(4).

<sup>5</sup> PN at 1.

zone calculations. In considering these issues, the Bureau should be guided by the overarching Commission directive to reduce the impact of satellite earth stations on UMFUS licensees.

## **II. THE COMMISSION SHOULD PROVIDE FLEXIBILITY TO UMFUS AND EARTH STATION LICENSEES**

AT&T agrees that the Bureau's proposal to define the power flux density contour to take into account any possible antenna pointing would allow for flexibility in earth station deployment while not increasing the aggregate impact on UMFUS licensees. As the Commission notes, earth station licensees collectively would not be permitted to exceed the 0.1 percent population threshold in any event. The Bureau's proposal does present an obvious trade-off, however. If an applicant files to cover the entire visible geostationary orbit, the potentially affected population, *ceteris paribus*, would be greater, and this could limit the ability for other earth stations to be licensed in that county or PEA. AT&T believes it is likely that there will be interest by satellite applicants in earth station licenses allowing operations across the entire visible geostationary orbit. The Commission should be aware of these tradeoffs that could potentially limit earth station deployments within an UMFUS license area if it affords licensees this flexibility. The Commission may want to consider apportioning the allowable aggregate contribution to the population limit among earth station applicants to avoid these issues. In any event, the Commission should not take any action that would be inconsistent with the R&O's objective of minimizing the impact of earth stations on UMFU services.

## **III. IN COMPUTING CONTOURS, PARTIES SHOULD USE OBJECTIVE CRITERIA, LEVERAGE EXISTING RESOURCES, AND RECEIVE THE INFORMATION NECESSARY TO MAKE COMPUTATIONS.**

The Bureau seeks comment on what propagation models exist that could be used to compute the required power flux density contour. AT&T agrees with the Bureau that it should

leverage existing propagation models, and notes the ITU's efforts in this area. By adopting a propagation model that is well-established and internationally recognized, the Bureau will promote more efficient interference coordination between satellite earth station licensees and UMFUS licensees. While AT&T does not endorse a specific propagation model at this time, in keeping with the objectives of the R&O, the Bureau should require the use of propagation models that minimize the size of the "interference exceedance area," (28 GHz) or "coordination area" (39 GHz) around earth stations.<sup>6</sup> This would reduce the restrictions on UMFUS licensees, in both cases, by minimizing the area within which 28 GHz UMFUS licensees could be potentially affected, and by minimizing the area where coordination between 39 GHz UMFUS licensees and earth station licensees is necessary. It also would likely increase the opportunity for additional earth station deployments by reducing the contribution of any single earth station toward the aggregate affected population limit.

The Bureau also should require the use of accurate antenna patterns. Earth station applicants will be seeking interference protection from UMFUS interference in the 39 GHz band while being permitted to cause interference to UMFU services in the 28 GHz band. If earth station licensees are permitted the flexibility to choose between FCC specified, measured or simulated antenna gain patterns, they will have an incentive to choose different methodologies for each band based on what best serves their objectives for that band. To promote clarity for all stakeholders, and in the spirit of minimizing the impact on UMFUS licensees, the Bureau should require the most accurate antenna patterns be used for both the 28 GHz and 39 GHz bands.

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<sup>6</sup> Although the term is not entirely accurate, for the sake of brevity, AT&T uses the term "protection zones" to refer both to "interference exceedance areas" and "coordination areas."

The Bureau also should encourage earth station applicants to take into account terrain and clutter to the extent that reliable models exist. This would help minimize the contours of the earth station's protection zone, reducing the impact on UMFUS licensees and accommodating multiple earth station applicants. Similarly, if applicants rely on self-installed shielding to further reduce their interference footprints, applicants in the 28 GHz band should be required to file post-construction certifications confirming that the shielding has been installed and field-tested to achieve the intended effect, as reflected in the application. If applicants in the 39 GHz band rely on self-installed shielding for earth station receive sites, such post-construction certifications need not be required, as only the applicant would be impacted if the shielding were not installed. Still, to the extent that an applicant relies on self-installed shielding in an application, UMFUS licensees should be allowed to rely on the earth station licensee's use of shielding when installing facilities.

It also will be critical that all earth station applications be made public, with actual notice to all affected UMFUS licensees. This will serve to inform subsequent applicants with regard to the sort of propagation models and calculations that are acceptable. Furthermore, subsequent applicants can better understand whether there is room under the numeric and population limits to support another application. In addition, actual notice to UMFUS licensees will help those licensees in planning deployments and encouraging more rapid coordination. Moreover, making the applications public and requiring notice will enable others to comment – and to challenge, if necessary – any unreasonable assumptions or calculations, aiding in the Bureau's review of the applications.

#### **IV. CALCULATIONS OF POPULATION SHOULD BE MADE WITH GRANULARITY AND SHOULD REFLECT THE MOST CURRENT DATA.**

In both the 28 GHz and 39 GHz bands, AT&T believes that the Bureau should determine population at the census block level. This is the most disaggregated unit of geographic measure, and has several benefits. First, census blocks “nest” into both counties and PEAs. Second, the use of a small geographic area such as a census block reduces the potential for measurement error when calculating estimates of the population impacted. Third, census block population is adjusted over time, as population changes. Applicants should be required to use the most recent census data to ensure accuracy and to reduce potential impacts on UMFUS licensees.

In addition, the Bureau should require the use of the “actual area method” of calculating population rather than the “centroid method.” While both methods are prone to some measurement error, the errors that result from the actual area method (which assumes uniform population distribution) are likely to be far smaller than those that will result from the use of the centroid method (which assumes that all population is located at a given point). Under the all-or-nothing algorithm inherent in the centroid method, if a proposed protection zone is strategically situated so as to avoid the “centroid” point of a geographic area, the estimated population impacted will be zero, regardless of the true population impacted by the proposed protection zone. Accordingly, by using the actual area method together with census blocks, the estimates of population impact will be far more accurate.

In the case of an application that proposes a protection zone that overlaps more than one license area, the Bureau should require that the site count toward the 0.1 percent population limit in each UMFUS license area affected, with the population for each license area counted

separately according to the portion of the proposed protection zone in each license area. This is consistent with the goal of minimizing the effects on UMFUS licensees.

To further the twin goals of maximizing the number of potential earth stations allowed within the numerical and population limits in the rules, as well as minimizing the impact on UMFUS licensees, the Bureau should encourage collocation of earth stations. As per §25.136(4)(i), collocated earth stations count as a single earth station toward the three earth station per license area limit.<sup>7</sup> Moreover, an applicant who seeks to collocate with an existing earth station should be required to count only any increase in the aggregate contour of collocated earth stations toward the population limits. For the same reasons, the Bureau should apportion the allowable population limit in a given license area among applicants. Applications should be limited to a protection zone (or an increase in the aggregate protection zone, for collocated sites) that would cover no more than 1/3 of the 0.1 percent population limit. By allocating the allowable population coverage limit in this way, the Bureau would ensure that more applicants are able to construct earth stations.

## **V. CONCLUSION**

The overarching goal of the Spectrum Frontiers Order was to make the 28 GHz and 37.5 to 40 GHz spectrum usable for terrestrial mobile services to accelerate the development and deployment of 5G mobile services. This objective need not exclude the use of satellite earth stations in the bands. In adopting methodologies for calculating the contours of protection zones

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<sup>7</sup> The Bureau should clarify that for purposes of the three earth station limit calculation in Rule 25.136(a)(4)(i), stations may be considered “collocated with or at a location contiguous to each other” and therefore count as one earth station only if their protection zones precisely overlap.

and other methodologies for the implementation of earth stations in the UMFUS spectrum bands, the Bureau should continue to be guided by the objectives of maximizing the number of earth station applications that can be approved consistent with the numeric and population limits in the FCC's Rule 25.136, but more importantly, also heeding the Commission's directive to minimize the impact of earth stations on UMFUS licensees.

Respectfully Submitted,

/s/ Michael P. Goggin

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